SRI LANKAN FAMILY PHYSICIAN

Vol. 33 No. 1 October 2017

Sri Lankan Family Physician

the Official Publication

of the

College of General Practitioners

of

Sri Lanka

Vol. 33 No. 1 **October 2017**

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Published by

College of General Practitioners of Sri Lanka
6, Wijerama Mawatha,
Colombo 7.
T'phone: 2698894 E-mail: cgpsl@sltnet.lk

Printed by

Ananda Press
277, Hokandara Road, Thalawathugoda.
T'phone: 2774793
E-mail: anandapress@ymail.com

ISSN 1391-1961

The Sri Lankan Family Physician

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Reference

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The Editors,

Sri Lankan Family Physician

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SRI LANKAN FAMILY PHYSICIAN

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Factors affecting adherence to inhaled corticosteroid use at general practice in Gampaha district – a descriptive cross-sectional study

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Sri Lankan Family Physician, 2017, **33**, 1-7

Abstract

Objective: The aim of this study was to determine the level of adherence to ICS and associated factors in adult asthmatics presenting to general practices in Gampaha district.

Methodology: A descriptive cross-sectional study was conducted in 10 randomly selected fulltime general practices in Gampaha district during a period of one year (2014/2015). The data was collected from 400 patients with Asthma, aged 18-70 years by using an interviewer administered questionnaire. Associations between adherence status to ICS and selected variables were analysed using chi square test for categorical variables.

Results: Adherence to ICS was poor and non-adherence was reported by 60%. The most frequently cited reason for non-adherence was the dislike of inhaler (41.8%). Non-adherence was significantly associated with female gender ($p<0.01$), younger age ($p< 0.001$), unmarried state ($p< 0.05$), monthly income > Rs. 20,000 ($p< 0.05$), duration of ICS use between 1-3 years ($p< 0.05$), poor perception of indications ($p<0.001$), poor perception of usefulness ($p<0.05$), and poor perception of consequences of abstaining ICS ($p<0.001$).

Good symptom control, less requirement to seek medical treatment and treatment related improvement of quality of life were the reasons given for good adherence.

Conclusions: This study revealed that adherence to ICS is poor among adult asthmatics presenting to general practices. Certain socio-demographic factors and poor perceptions of patients were associated with non-adherence. Non-adherence after 1 to 3 years duration of ICS use is significantly higher compared to initial one year of use.

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Introduction

Asthma is a chronic inflammatory disease of airways which is associated with variable airflow limitation (VAL). It is characterized by recurrent respiratory symptoms consisting of cough, wheeze, chest tightness and shortness of breath. These symptoms and intensity differ from person to person and wax and wane over time[1]. Moderate to severe asthma can result in episodic exacerbations which may be life threatening and can be a significant burden to the patient, family and community[1].

Approximately 334 million people all over the world are affected with asthma resulting in reduced quality of life and loss of productivity[2].

The prevalence of doctor diagnosed asthma, clinical/treated asthma and wheezing in adults in Sri Lanka were 2.6%, 2.75% and 6.35% respectively[3]. According to published data by WHO in 2011, deaths due to asthma in Sri Lanka were 2.33% of total deaths. Furthermore, age adjusted death rate was 13.58 per 100,000 population, placing Sri Lanka in the 20th position in the world[4].

Asthma is diagnosed by typical recurrent respiratory symptoms and VAL. Confirmation of VAL is done by objective measurement of lung function[1].

The long-term goals of management are controlling symptoms and minimizing the risk and, the cornerstone of management is ICS[1].

Adherence to medications is defined as the extent to which use of medication by the patient corresponds with the prescribed regimen[5]. WHO has defined three forms of non-adherence to ICS namely, erratic non-adherence, unwitting non-adherence and intelligent non-adherence. In erratic non-adherence which is the common form, doses are missed because of forgetfulness, and changing schedules or busy lifestyles. In unwitting non-adherence, patients have failed to understand fully either the specifics of regimen or the necessity for adherence. In intelligent non-adherence, patients purposefully alter, discontinue, or even fail to initiate ICS therapy[6].

Although long-term use of ICS is important in asthma control and has markedly reduced asthma morbidity, adherence rates vary between 22% and 63%[8]. The different forms of non-adherent behaviour is associated with distinct contributory factors. Good understanding of diversity and complexity of adherence behaviour is important in management of asthma[6].

Many factors contribute to non-adherence to ICS and can be categorized as medication related and medication unrelated[7].

Specific measures that can be used for promoting adherence to ICS can be categorized as educational strategies, behavioural strategies and tailoring of therapy[7].

Many patients with asthma are treated in a primary care setting. The general practitioner who has a good long-term relationship with the patient, is therefore in a key position to recognize poorly controlled asthma and to improve asthma management[8].

As there is paucity of information on predictors of poor compliance of ICS in the primary care setting in Sri Lanka, this research was undertaken. The study aims to determine the level of adherence to ICS and associated factors in adult asthmatics presenting to general practices in Gampaha district. The results obtained from this study will definitely help the general practitioner in promoting adherence to ICS and achieving better clinical outcomes of asthmatics in future.

Methods and material

Design, setting and participants

Descriptive cross-sectional study was conducted in GP settings in Gampaha District. Adult patients with asthma on inhaled corticosteroids with age between 18 years and 70 years presenting at full time GPs were included. Study was conducted over 1 year from 07/05/2014 to 30/04/2015.

Sample

The main outcome variable, the level of adherence to ICS, was set at 50% since it was unknown. The sample size was calculated using following formula:

$$n = \left(\frac{Z}{l}\right)^2 p(1-p)$$

Whereas, the number of patients (n) required to estimate a proportion (p) of 50% with 95% confidence intervals within ±5% precision (l) was 384. With consideration of non-responders, 400 patients were included in the study.

From the Desk Top directory 2013/2014 published by the College of General Practitioners Sri Lanka 10 GPs in Gampaha district were selected randomly using random number generation function of Microsoft excel software. Forty patients with eligibility criteria were selected consecutively from each practice until calculated sample size was achieved.

Data collection and analysis

An interviewer-administered questionnaire was used to collect data by the principal investigator. Data entry and statistical analyses were conducted using SPSS 20 statistical software. Descriptive statistics were presented using percentages, means and standard deviations. Significance for associations between adherence status to ICS and the selected variables were analysed using chi square test for categorical variables.

Non-adherence was defined as any deviation in dose or frequency from the latest prescribed dose or frequency as reported by the patient. Adherence status was analysed from the responses to four questions in the questionnaire. They are: 1) How many times per day did the doctor ask you to take (preventer) inhaler? 2) How many capsules/ inhalations/ puffs of steroid (preventer) inhaler did the doctor ask you to take per dose? 3) How often do you use the steroid (preventer) inhaler? 4) How many capsules/ inhalations/ puffs of steroid (preventer) do you take per dose?

Ethical clearance

Ethical clearance was obtained from the ethics review committee of the Faculty of Medical Sciences, University of Sri Jayawardenapura on 06.05.2014.

Results

Median age of the group was 52 years with inter quartile range (IQR) of 38 to 62 years.

Of the 400 interviewed majority were Sinhalese (n=329; 82.3%) and Buddhists (n=293; 73.3%). Majority (n=291; 72.8%) were females and most of the participants (n=292; 73%) were currently married. More than half of the group (n= 235; 58.8%) has studied up to grade 10 and above and only152 (38%) were employed. Approximately half of the individuals (n=189; 47.3%) had monthly family income of more than Rs.20000 and, 91(22.8%) were dependent on other family members.

More than half of the clients (n=211; 52.8%) had asthma for more than 10 years duration. More than half (n= 232; 58%) were using ICS more than 3 years. Majority (n=345; 86.3%) were on dry powder inhaler which required capsules to be inserted

Approximately one fourth of the participants (n=97; 24.2%) had no idea about the nature of the disease. Majority (n= 260; 65%) knew that steroid inhaler was used to prevent asthma. From the participants 371 (92.7%) were of the view that inhaler was beneficial. Two hundred and fifty two (63%) were under the impression that asthma became worse in the event of non-adherence.

The results revealed that almost 60% of patients (n=240) were not adhering to ICS – non-adherence was defined as any deviation dose or frequency from the latest prescribed dose or frequency as reported by the patient.

About one fifth (n=77; 19.3%) stopped ICS when symptoms resolved and, a considerable proportion (n=54; 13.4%) stopped ICS completely.

Majority of participants (n=191; 80.3%) demonstrated intelligent non-adherence.

Table 1. Distribution of the participants by the forms of non-adherence without reasons*

Characteristics	*Number*	*Percentage*
Erratic non-adherence	75	31.2
Unwitting non-adherence	35	14.7
Intelligent non-adherence	191	80.3

*N=240
More than one response allowed

Adherent individuals (n=160; 40%) gave more than one reason for their adherent behaviour and majority (n=158; 98.8%) were of the opinion that they were adherent as it controlled their symptoms well.

The reasons given for non-adherence by the 240 non-adherent patients are given in Table 2.

The status of adherence according to the selected socio-demographic characteristics of the study group is given in Table 3.

Proportion of non- adherence was more among the age ≤ 40 years category (72.3%; n=86) and age 41-60 years category (60.4%; n=102) than in the >60 years category (46.4%; n=52) and difference was statistically significant ($p < 0.001$).

Compared to males (49.5%; n=54) proportion of non-adherence among females (63.9%; n=186) were more and the difference was statistically significant ($p< 0.01$).

Compared to currently married (57.9%; n=169) and divorced/separated/widowed group (57.6%; n=38), the unmarried group was more non-adherent and the difference was statistically significant ($p < 0.05$).

Proportion of non-adherence was more among income > Rs. 20 000 group (67.2%; n=126) compared to income ≤ Rs. 15 000 group (56.7%; n=34), ≤ Rs.15 000 but ≤ Rs.20 000 (50.0%; n=30) and dependent individuals (53.8%; n=49) and the difference was statistically significant ($p < 0.05$).

The status of adherence according to duration of using ICS is given in Table 4.

Compared to other categories of duration of use of inhaler, 1-3 year group (71.9%; n=87) demonstrated more non-adherence and the difference was statistically significant ($p < 0.05$).

The status of adherence according to participants' perception on asthma and treatment is given in Table 5.

Proportion of non-adherence was more among participants who were of the view that they used the inhaler to relieve the symptoms (87.3%; n=103) than the groups who were under the impression that they used it

Table 2. Distribution of the non-adherent participants by the reasons for non-adherence according to the participants*

Characteristics	*Number*	*Percentage*
Patient factors		
Forgetfulness	71	29.5
Feels better without ICS	91	38.1
Thinks it is not needed	79	33.1
Fear of addiction	82	34.3
Fear of damage to lungs	53	22.2
Inhaler factors		
Expensive	26	10.9
Side effects	34	14.2
Difficult technique	7	2.9
Drug is over	8	3.3
Dosing regime is complex	5	2.1
Dislikes the inhaler	100	41.8
Factors related to doctor		
Instructions not understood	28	11.7

*n=240
More than one response allowed

Table 3. Status of adherence according to the selected socio-demographic characteristics of the study group

Characteristic	*Status of adherence*		*p Value*
	Adherence (N=160) N%	*Non-adherence N=240) N%*	
Age category			
≤ 40 years	33 (27.7%)	86 (72.3%)	< 0.001
41-60 years	67 (39.6%)	102 (60.4%)	
>60 years	60 (53.6%)	52 (46.4%)	
Sex			
Male	55 (50.5%)	54 (49.5%)	0.009
Female	105 (36.1%)	186 (63.9)	
Marital Status			
Never married	9 (21.4%)	33 (78.6%)	0.034
Currently married	123 (42.1%)	169 (57.9%)	
Divorced/ Separated/ Widow	28 (42.4%)	38 (57.6%)	
Family income			
> Rs.15 000 but ≤ Rs. 20 000	30 (50.0%)	30 (50.0%)	0.040
> Rs. 20 000	62 (32.8%)	126 (67.2%)	
Dependent/ Do not know	42 (46.2%)	49 (53.8%)	

Table 4. Status of adherence according to duration of using ICS

Characteristic	*Status of adherence*		*p Value*
	Adherence N%	*Non-adherence N%*	
Duration of using ICS (n=400)			
< 1 year	21 (44.7%)	26 (55.3%)	
1-3 years	34 (28.1%)	87 (71.9%)	0.023
>3 years but ≤ 5 years	39 (48.8%)	41 (51.2%)	
>5 years-10 years	37 (41.1%)	53 (58.9%)	
>10 years	29 (46.8%)	33 (53.2%)	

Table 5. Status of adherence according to participants' perception on asthma and treatment

Characteristic	*Status of adherence*		*p Value*
	Adherence (N=160) N%	*Non-adherence N=240) N%*	
Perception on need to use ICS			
To relieve wheezing and breathing difficulty	15 (12.7%)	103 (87.3%)	<0.001
To prevent wheezing episodes	136 (52.3%)	124 (47.7%)	
Do not know	9 (40.9%)	13 (59.1%)	
Perception of the consequences of not using ICS			
Disease will become worse	130 (51.6%)	122 (48.4%)	
There will no change in the disease	8 (6.8%)	109 (93.2%)	0.000
Do not know/ Other	22 (71.0%)	9 (29.0%)	

for the purpose of prevention (47.7%; n=124) and individuals and who had no idea why they used it (59.1%; n=13) and the difference was statistically significant (p< 0.001).

Proportion of non-adherence was more among the group who was of the opinion that inhaler was not useful and who had no idea about the usefulness (82.8%; n=24) compared to the individuals who thought the inhaler was useful (60.3%; n=161) and very useful and the difference was statistically significant (52.9%; n=55) (p< 0.05).

Proportion of non-adherence was more among the individuals who felt no change after stopping the inhaler (93.2%; n= 109) than individuals who had the experience of worsening of the symptoms on cessation of inhaler (48.4%; n=122) and individuals who had no idea of consequences of stopping it (29%; n=9) and the difference was statistically significant (p <0.001).

Discussion

To the best of our knowledge this is the first study conducted in general practice setting in Sri Lanka to examine the adherence and factors affecting adherence to ICS among adult asthmatics. This study has a scientifically robust methodology and, all the interviews were conducted exclusively by the principal investigator with the assistance of a well-structured questionnaire.

In this study, non-adherence to ICS was 60%. This rate is higher than the observations of WHO which recorded that treatment compliance in chronic disease as 50%[5]. A study done in USA similar to this study in GP the non-adherence to ICS was 62%[9]. Two studies done in Sri Lanka in tertiary care setting in Teaching Hospital Karapitiya and National Hospital of Sri Lanka showed that non-adherence levels to ICS were 33% and 40% respectively[10, 11].

In this study, compared to males non-adherence was more among females and the difference was statistically significant. Many studies give contradictory results regarding this issue. Some researchers found that females had more adherence but some studies suggested otherwise[12,13]. Some of the studies could not find a relationship with gender and adherence[14].

This study showed that younger patients were non-adherent to ICS than older patients, and the results were statistically significant. This may be due to the more concern the older patients have regarding their health status[14, 15]. However, a different result was seen in a study done in Michigan USA, which revealed social isolation, auditory and visual defects poly-pharmacy resulted in reduced adherence level among older individuals[16].

Marital status might have a positive influence on adherence to medication and, help and support from a spouse could be a reason why married patients showed more adherence than single. But more recent studies did not find any relationship[17]. This study showed a statistically significant difference of more non-adherence in unmarried individuals compared to married individuals. In contrast, in this study there were fewer non-adherences among divorced/separated/widowed group.

In this study, non-adherence was significantly associated with poor perception of need to use the inhaler, usefulness of the inhaler and consequences of not using the inhaler. Surprisingly there was no significant difference between patient's poor perception of nature of disease and non-adherence. The result of a study done in Saudi Arabia found that one factor associated with non-adherence to ICS was negative perception of asthma and the role of ICS and it highlighted the importance of educating the patient regarding asthma and role of asthma medication[18].

Individuals with good adherence gave the reasons as good symptom control (98.8%), no need for emergency treatment (74.4%), less need to consult a doctor (69.4%) and improvement of quality of life (55%). This reflects that the probable reason for good adherence is the severity of asthma as revealed by a study done in USA and this needs further studying[19]. In contrary, another study revealed that compliance was not modulated by asthma severity[20]. A study done in Egypt confirmed the importance of patient education in increasing adherence[14].

Facts that need attention are that only 17.5 % knew benefits of inhalers, only 33.8% knew that inhaled medicine has fewer side effects compared to oral medications and only 20.8% thought it was cost-effective. Above facts should be considered and need to be highlighted in health education during consultations in GP.

In this study commonest reason given for non-adherence was that the patient disliked the inhaler (41.8%). In general, Sri Lankans have lot of misconceptions about inhalers which have led to the aversion to inhalers. The other reasons given like, "felt better without inhaler" (38.1%) and "no need for inhaler" (33.1%), shows the importance of finding out whether the inhaler is really indicated, especially for patients who have been on ICS for more than 3 years. Worry about addiction (34.3%) and fear about damage to lungs by ICS (22.2%), definitely can be dealt with by the GP by individual education during consultations. In addition, forgetfulness also plays a big role in non-adherence and GP is the best person to discuss regarding factors contributing to this and draw up a plan to alleviate this. Further 14.2% had side effects which also can be resolved in the general practice set up with the help of trust the patient has in the GP. One tenth (10.9%) found the inhaler expensive and it is very important to consider affordability when prescribing. Another significant contributor which is worrying is the factor that the patient did not understand the instructions of the doctor (11.7%), and needs special consideration in the GP consultation.

In this study, unwitting adherence accounted for 14.7%. Researchers have found that patients frequently forget the instructions given by the physician during the consultation. It is common to misunderstand the difference between *pro re nata* and daily medication[5, 6].

The reasons given by the patient for not using ICS almost every day reveal that many patients with asthma believe it as a period of wellness mixed with increased symptoms, a model which not surprisingly leads to inconsistent use[21]. Taking this factor into consideration, GP should take efforts to target at patient's perception and behaviour towards ICS.

Conclusions

This descriptive study illustrates that adherence to ICS is poor among adult asthmatics in Gampaha district. Furthermore, it highlights that certain socio-demographic factors (sex, age, marital status, higher income) affects the adherence to ICS. It revealed that female gender, younger age and unmarried state and higher income led to poor adherence. Additionally, duration of use of ICS between 1-3 years was significantly associated with non-adherence. Furthermore, the perception on treatment of asthma is poor among the participants and this plays a big role in non-adherence. Good adherence is associated with patient perception of well controlled asthma with improvement of quality of life.

Non-adherence behaviour was associated with factors related to patient, inhaler and the physician. Furthermore, non-adherence was associated with misconceptions on the role of ICS and fear of untoward side effects

The results of this study raise the importance of patient education by the doctor, focussing more emphasis on role of ICS, and alleviating common fears and misconceptions.

In future consultations a GP needs to focus more attention on health education, interventions to address concerns and, closely follow up patients belonging to younger age, male gender, duration of ICS use between 1-3 years, unmarried groups and high income groups.

Furthermore, a GP should pay more attention to the real indications for ICS and, the inhaler device should be selected according to the preference of the patient after giving all possible those available.

A GP can promote adherence to ICS by coordination of care with the assistance of a practice nurse, and a pharmacist and could also obtain help of the specialist in the event of shared care. GP also can combine multiple strategies including patient counselling, reminders, reinforcement, and written asthma action plan and asthma self-management education for this purpose.

Additionally, a GP should give individualized attention and extra time during a consultation and, should focus on stepping up or down ICS use according to asthma control and should review inhaler technique in each and every visit to achieve good control of asthma which in turn will improve adherence.

A GP should use the long-term doctor patient relationship, to elicit and address the patient's unique barriers to adherence. Furthermore, GP should help the patient to resolve the common concerns about ICS use, emphasizing on the factors which were revealed in this study and, should motivate them with the help of a brief motivational interview.

Poor adherence with ICS is common, and is a major factor in determining asthma morbidity. There are many factors which can be improved regarding the adherence to ICS in adult asthmatics in the general practice setting in Sri Lanka. A better understanding of usage of ICS among adults could be obtained by future research. A larger study to evaluate clinically important outcomes such as exacerbations in patients with poor adherence is now needed. Such research will help the GP to acquire knowledge on methods of improving adherence to ICS among adults visiting general practices, by improving attitudes of the patients towards treatment.

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General practitioners requesting radiological investigations: A qualitative study of the perceptions of radiologists

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Sri Lankan Family Physician, 2017, **33**, 8-12

Abstract

Background: General practice provides person centred, continuing, comprehensive and coordinated whole person care to individuals and families in their communities. Patients present with early nonspecific symptoms of disease and general practitioners need to be very discriminating when deciding on investigations. Indiscriminate or inappropriate use of radiological investigations could expose patients to unnecessary harm and is a waste of resources. Failure to refer for necessary investigations may lead to inefficient patient management.

This study was carried out to identify the various aspects of the process of general practitioners requesting radiological tests and radiologists' perceptions of this process in Sri Lankan settings.

Methodology: Person to person telephone interviews were conducted by one of the investigators with ten consultant radiologists working in different areas of Sri Lanka. A semi structured questionnaire regarding general practitioner requests for radiological investigations was used as a study instrument. Recorded information was studied in depth and then coded. Codes were then combined into themes and analysis was done independently by two investigators and reviewed together with discussion on any disagreements leading to a consensus view.

Results: The main findings of the study were that the majority of radiologists thought that most of the requests for radiological investigations were appropriate, however they were disappointed with the provision of background information with the requests such as basic data, clinical history, previous investigations and tentative diagnosis. It was generally thought that a structured referral form would improve the quality of the process of requesting investigations. Radiologists appreciated that a clear pathway of communication with general practitioners was important especially regarding the follow up of the patient.

Conclusion: There is a need to improve specific aspects of general practitioner knowledge to facilitate efficient utilisation of radiological investigations and ensure patient safety. General practitioners need to be more diligent regarding provision of adequate clinical information regarding the patient to the radiologist in order to make optimum use of the investigation and the time of the radiologists. Good communication between the referring general practitioner and radiologist will improve the quality of care for the patient.

Keywords: general practitioners, radiologists, radiological investigations.

Background

General practice provides person centred, continuing, comprehensive and coordinated whole person care to individuals and families in their communities[1].

Patients present with early nonspecific symptoms of disease. Doctors often rely on a good history and clinical examination and use investigations sparingly. However when investigations are required there should be a clear pathway of access and utilisation of the appropriate investigation in order to provide optimal care for patients.

Radiological imaging is one aspect of investigations that general practitioners (GP) may have to use. The results of a radiological investigation may help the GP to diagnose and manage the condition himself avoiding other specialist referral or could help to further refer the patient to the appropriate specialist. Investigations may also be useful to exclude an illness or reassure a patient in certain circumstances. The appropriate and timely use of radiological investigations by general practitioners have been found to reduce unnecessary referrals and reduce delay in diagnosis and initiation of specific treatment for patients in general practice.[2]

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In order to request these investigations GPs should be able to communicate efficiently with radiologists. A request for a radiological investigation should be accompanied by clear indications for the request, a full history, and clinical findings. Referral for an imaging examination is generally regarded as a request for an opinion from a specialist in radiology or nuclear medicine.[3]

The field of radiology is a rapidly expanding one. GPs need to have the necessary knowledge to decide when to request investigations and on the appropriate investigations to request. Indiscriminate or inappropriate use of radiological investigations could expose patients to unnecessary harm and is a waste of resources. Failure to refer for necessary investigations may lead to inefficient patients' management.

This study was carried out to investigate the various aspects of the process of GPs requesting radiological tests and radiologists perceptions of this process in Sri Lankan settings.

Methodology

This was a qualitative study. Ten radiologists of both genders (six male and four female) were purposively selected to represent different areas of the country.

A semi structured interview guide was designed based on available literature, discussion with other GPs and researcher experience to cover different aspects of the process which included appropriateness of the investigations requested by GPs, information expected in request forms, ideas on how to enhance communication and coordination between GPs and radiologists.

A trained pre intern medical officer still not involved in patient care conducted the interviews over telephone as it was thought that this would encourage frank disclosure of the views of the interviewed radiologists. All interviews were recorded and transcribed verbatim. The transcribed information was studied in depth and then coded. Codes were then combined into themes by grouping codes that related to each other. To ensure adequate reliability and validity analysis was done independently by two investigators and reviewed by all investigators with discussion on any disagreements leading to a consensus view.

Results

Common investigations requested by primary care doctors

Ultra sound scans and x rays were the commonest investigations requested by GPs.

Appropriateness of the investigations requested by GPs

The majority of radiologists agreed that investigations requested were appropriate for the clinical problem in most cases. Two radiologists estimated that 10% of requests were inappropriate (CR 1, CR 9).

Two consultants specifically stated that requests for venous duplex scans were sometimes inappropriate and done unnecessarily and could have been avoided if a proper history and examination had been done by the family doctor (CR 3, CR 4).

Regarding X rays one consultant commented that GPs seemed to have poor knowledge of the necessary views for different problems. Sometimes X rays were requested inappropriately and without a proper indication eg. "AP and Lateral skull X rays for nonspecific headache won't help" (CR 3).

Quality of the investigation requests sent by GPs to radiologists

The request form is the tool to communicate vital information to the radiologists. However most of the radiologists in this study revealed dissatisfaction with the information given in the request forms sent to them. Overall they highlighted the importance of providing basic demographic data, a comprehensive clinical history and recording of examination and investigation findings as well as the tentative diagnosis.

"clinically when the request is made the doctor is having a tentative diagnosis and it is very useful to have that in the request forms" (CR2).

Many quoted frequently having to take detailed histories from patients due to the inadequacy of information provided by the referring doctors.

"most of the time they don't give the history" (CR1).

Radiologists also said that sometimes even basic data regarding patient identification details such as name age and X ray number were often not mentioned.

One doctor stated that it would be helpful to note whether the request was urgent or a routine request to help them prioritise investigations appropriately.

It was stated by many consultants that details regarding the site were especially inadequate in requests for investigations on lumps. They stated that this could save valuable time examining the patients to look for the lump.

"where the problem is, what about the area, what are you looking for, that kind of information is very important" (CR 5).

Many consultants stated that a clinical history, examination findings and thyroid function tests if available were very important for imaging requests for the thyroid. Drawing the site of the lump in the request form was mentioned as important as a clinically suspected "thyroid lump" could be something else on imaging.

"if there is a palpable nodule they must mark it in the request, where is the nodule clinically, ultra sonically it may be something else" (CR 1).

Requests for duplex scans were particularly problematic. Several consultants stated that often there was no specification of whether the request was for a venous or arterial scan which was important as the indications for the specific scans were different. Sometimes the basic information regarding which side and whether bilateral duplex scan was necessary was not given.

A clinical history was very important for reporting of X rays as one radiologist pointed out that in this instance the patient was often not present to give a history and the consultant had to rely on the information provided by the GP. Some doctors mentioned that previous X rays should be sent in order to compare and gather maximum benefit from the investigation.

Structured form to request USS

Most of the consultants stated that a structured referral form would be useful however they mentioned that is should contain all necessary information but also be "short and sweet"(CR 2). It was stated that a structured form could prompt the requesting doctor to include all necessary information.

"If you have a standard form the person who writes the request will be automatically compelled to write history, clinical findings etc. When it is a blank paper they just write ultrasound abdomen and that's it" (CR3).

However one doctor thought that a structured form would not be useful as the presentations were varied and would need individualised requests to be written. "each patient presents in a different manner then you send the structured form I don't think it will be helpful (CR 8).

Adequacy of utilisation of radiological investigations by GPs

The radiologists opinions were divided on whether GPs were utilising imaging investigations adequately. Four doctors thought GPs were using these investigations adequately. Three radiologists thought that radiological imaging was overutilised by GPs.

One doctor stated that there was inadequate concern for the risks of the investigations to patients.

"Some GPs never think about the radiation dose to the patient" (CR 8).

Another said there was too much emphasis on investigations and inadequate use of clinical skills by GPs.

"they give up clinical judgment and depend on radiological investigations. That is the problem" (CR 2).

Three doctors thought that radiological investigations were underutilised by doctors. One doctor stated that he received very few requests from GPs and expressed the opinion that he thought that GPs were not utilising these resources adequately.

Some doctors said that use of radiological investigations by GPs was limited and they especially mentioned investigations such as "barium studies, IVUs and Doppler studies" (CR 5).

Communication between GPs and radiologists

Some of the radiologists wanted feedback on the patients from the GPs and were not happy about the lack of feedback post investigations.

We don't get a feedback. "They should give us a feedback then we know what they want; if not they just ask for scans, we write and we don't know what happens to the patient (CR 1).

One radiologist stated very frankly that feedback from the GP could help improve his skills. "feedback is very much needed to improve my findings as well" (CR 10).

One doctor suggested that GPs should communicate directly with the radiologist through telephone or e mail. (CR 4).

Some doctors stated that it was important to provide a telephone number of the referring GP in case there was a need to communicate emergency information about the patient eg. A malignancy, surgical emergency etc (CR 6, CR 10).

Some doctors mentioned the importance of establishing a formal referral system within the country (CR 5).

Other suggestions

Some consultants suggested that attempts should be made to educate GPs on available resources and improve their basic knowledge on radiological investigations.

One consultant suggested that if GPs used the Sri Lanka College of Radiologists guidelines the quality of referrals would improve.

Strengths and limitations

The semi structured interviews were conducted individually therefore independent opinions could be gauged from the consultant radiologists excluding bias inherent in group techniques such as social acceptance bias.

This study was conducted by doctors involved in general practice therefore there may have been some bias in interpretation of data due to the background of the investigators.

Discussion and conclusions

In this study a majority of radiologists thought that requests for radiological investigations were appropriate. However there were many lapses. Previous studies have indicated that that up to 20% of diagnostic imaging procedures may be inappropriate or contribute no useful information[4].

It is obvious from the findings that GPs should be educated on the different aspects of requesting radiological imaging such as the appropriate investigations for the clinical problems and the risks associated with these investigations. The radiologists participating in this study raised a query on whether imaging investigations were utilised appropriately by GPs. Education of GPs will help fill in gaps in GP knowledge on appropriate imaging and lead to improved efficacy of the referral process, expedite patient care at the primary care level itself, optimise cost of care and widen the range of radiological investigations utilised by GPs. Previous studies have reported that guidelines could help improve the quality of the process of referring for radiological investigations and reduce the number of unnecessary requests for imaging[5,6].

Radiological investigations should be undertaken with extreme discretion as they often expose the patient to radiation. Guidelines clearly state that it is the referring doctors responsibility to provide adequate information to the radiologist who should determine if the requested investigation is appropriate and the exposure to radiation is justified[7]. The results of this study highlight inadequacies in GP requests for radiological investigations and the importance of communicating necessary information regarding the patient to the radiologist in a precise and succinct way in order to ensure appropriate prioritisation of investigations, to save time and ensure maximum use of available resources. Numerous audits and studies have reported that inadequate provision of information with radiological requests is a common problem[7]. The consensus view of radiologists in this study was that a structured request form could facilitate this process as reported by other studies conducted in the past[8,9].

There are only a few studies on the relationship between radiologists and GPs. GPs have little opportunity for discussion with the radiologist they are referring to. It is reported that the radiology report is often the sole method of communication from the radiologist to the general practitioner (GP) in the primary care setting[10]. Good communication is important to achieve a better outcome for the patient through appropriate imaging investigations being done. In this study it was heartening to discover that the majority of radiologists were willing to have a clear path of communication with GPs. It is important that the GP should have the opportunity to communicate with the radiologist in an emergency or if there was a necessity to discuss options regarding the requested investigation if the clinical radiologist thought it was necessary. Radiologists also appreciated receiving feedback on the clinical outcome of the patient and the findings of this study show that good communication between GP and radiologist could lead to improved health outcomes for patients as well as lead to improved quality of GP and radiologist clinical practice.

The findings of this study provide information to implement practical ground level strategies to improve GP use of radiological resources in Sri Lanka. This information highlights the need for good communication between the GP and the radiologist and the findings may inform the development of guidelines for primary care doctors referring for radiological investigations.

Declarations

Ethics approval

The Ethics Committee of the Faculty of Medicine, University of Kelaniya granted ethical clearance to conduct this study. Written informed consent was obtained from radiologists.

Competing Interests

None of the authors have any financial or non financial competing interests.

Acknowledgements

We are grateful to all the participating radiologists.

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Cardiovascular risk factors during menopause transition and early post-menopausal period in women undergoing non-communicable disease screening

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Sri Lankan Family Physician, 2017, **33**, 13-20

Keywords: menopause,menopause transition, Sri Lanka,non-communicable diseases, cardiovascular disease

Introduction

Menopause is the permanent cessation of menstruation resulting from the loss of ovarian follicular activity. Natural menopause is diagnosed retrospectively after 12 consecutive months of amenorrhoea, for which there is no obvious pathological or physiological cause[1]. Menopause usually occurs in the late 40s or early 50s, and the median age of menopause in Sinhalese women is reported to be 51.12 years[2]. Menopause transition is the period of time before the final menstrual period, usually one to two years before menopause, when the variability in the menstrual cycle is usually increased[1]. During menopause transition and after menopause the prevalence of cardiovascular disease (CVD) risk factors in women increases[3]. However whether this increased risk is due to menopause itself or due to other factors such as ageing has been a much debated subject[4,5].

Oestrogen facilitates a cardio-protective hormonal milieu in pre-menopausal females, and it has been shown that women with more years of exposure to endogenous oestrogen had a statistically significant reduction in cardiovascular mortality[6]. This protection is attenuated by the increased androgenicity after menopause, contributing to a higher CVD risk[7-9]. The cardio-protective effect of oestrogen is mainly via conferring a favourable effect on the lipoprotein and lipid metabolism and also by giving rise to vascular wall changes[10-12]. Therefore, deficiency of oestrogen is associated with a detrimental effect on cardiovascular function. Additionally there is a change of body fat distribution, with an increase in central adiposity, total adiposity and visceral adipose tissue deposition, especially in South Asians. Therefore, weight gain is a commonly encountered complication after menopause[13-15]. This will further lead to obesity after menopause, and contribute to the development of insulin resistance, hypertension, pro-atherogenic lipid profile and metabolic syndrome, ultimately resulting in an increased cardiovascular risk[14,16,17].

Cardiovascular disease (CVD) is the leading cause of death of women worldwide, killing approximately more than 8.6 million women around the world each year, representing one third of all deaths in women[18]. The average lifetime risk for CVD in women is approximately one in two[19]. Every year, more women than men worldwide die of CVD[20], and early mortality following myocardial infarction is higher and long-term prognosis is worse in women than in men[19]. Women who develop CVD in low and middle-income countries are more likely to die from it than women from industrialized nations[21]. In Sri Lanka, a lower middle income country, an estimated 40% of total deaths of both sexes are accountable to CVD[22]. Additionally, the prevalence of obesity, hypertension and metabolic syndrome is higher in females than in males in Sri Lanka[23,24].

As the estimated average life expectancy at birth for Sri Lankan females is 78.6 years in 2014[25], on average, a woman has to spend approximately one third of her life after menopause. However, there is a dearth of published data on the CVD risk in post-menopausal women in Sri Lanka. As the population >60 years in Sri Lanka is projected to approximately double by year 2050 with approximately 50% comprising post-menopausal women[26], it is important to identify the CVD risk factors for these women at an early stage and implement necessary preventive and remedial measures for an optimal outcome. The aim of this study was to evaluate the CVD risk, in women during menopause transition and early post-menopausal period, who underwent non-communicable disease (NCD) screening at a NCD clinic in Sri Lanka.

Methodology

A preliminary cross-sectional descriptive study was conducted at the NCD clinic at Wijaya Kumaranatunga Memorial Hospital, Seeduwa, where women who wish to undergo NCD screening attend voluntarily. Consecutive sampling was done, recruiting all consenting women ≥40 years of age who attended the clinic for NCD screening. Those who had previously undergone hysterectomy / salpingo-oophorectomy / undergoing treatment for subfertility or using hormonal contraception were excluded. The total study sample included 63 females from this semi-urban population who fulfil the above stated inclusion and exclusion criteria.

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Data was collected via an interviewer-administered questionnaire, by the medical officers at the clinic. Meticulous care was taken to ensure the confidentiality of the study participants. A detailed systemic examination was conducted to obtain the physical and anthropometric measures of height, weight, waist circumference and blood pressure. Blood samples were obtained and analysed for fasting plasma glucose and lipid profile, which included triglycerides, total cholesterol, LDL-c and HDL-c. The participants of the NCD screening clinic had been previously advised to have overnight fasting with at least 10 hours on the preceding day.

The monthly income of participants was categorised into 4 sections, which were consolidated ranges taken from the Household Income and Expenditure Survey 2012/13 conducted by the Department of Census and Statistics of Sri Lanka[27].

Type 2 diabetes mellitus was diagnosed as per the current recommended guidelines by the American Diabetes Association (ADA)[28], as fasting plasma glucose (FPG) levels ≥126 mg/dl (7 mmol/l), being under treatment, or self-reported previously diagnosed Type 2 diabetes. Impaired fasting glucose (IFG) was defined as FPG levels of 100 mg/dl (5.6 mmol/l) to 125 mg/dl (6.9 mmol/l). Hypertension was defined according to the seventh report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure (JNC 7) definitions[29], as blood pressure (BP) ≥140/90 mmHg, being under treatment, or a self-report of previously diagnosed hypertension, and pre-hypertension defined as systolic BP of 120 to 139 mmHg or a diastolic BP of 80 to 89 mmHg. Dyslipidaemia was defined using the National Cholesterol Education Program – Adult Treatment Panel (NCEP ATP-III) definition[30], and the cut-off values for high triglycerides, total cholesterol, LDL-c and HDL-c taken as 200 mg/dl, 240 mg/dl, 160 mg/dl and 60 mg/dl respectively.

Metabolic syndrome was defined according to the International Diabetes Federation (IDF) criteria[31], diagnosed in those with central obesity and any 2 of the following factors: raised triglycerides (≥150 mg/dl); reduced HDL-c (<50 mg/dl in females); raised blood pressure (systolic BP ≥130 mmHg or diastolic BP ≥85 mmHg) and raised fasting plasma glucose (≥100 mg/dl or being under treatment for these abnormalities. Obesity and central obesity were defined as per current recommendations published in 2015 by the Endocrine Society of Sri Lanka[32]. Accordingly, BMI was categorised into overweight (23-24.9 kg/m^2 and obese (>25 kg/m^2) and central obesity was defined as waist circumference > 80 cm in women.

Data was analysed using the statistical software package of IBM®SPSS Statistics® (version 22). Descriptive data were analysed using mean, mode, standard deviation, percentages and proportions. Comparative data with continuous variables were analysed using Student t-test and categorical variables using Chi-square test with Yates' correction for continuity. All statistical assessments were two-sided and the level of significance was set at $p<0.05$.

Results

Sixty three women participated in the study. Participants' mean (+/-SD) age was 52.33 (±7.11) years. Most (71.4%, n=45) had reached menopause, and the mean (+/-SD) age at menopause was 47.45 (±5.76) years. The educational level of the participants was satisfactory, with the majority (52.4%, n=33) having an education up to GCE O/Ls. Almost half of the participants (49%, n=31) had a monthly income less than Rs. 30,815, which was the median monthly income for 2012/2013 in Sri Lanka[27].

Most 77.8% (n=49) reported had no regular exercise, with only about 10% having physical exercise more than 5 days per week. Majority (58.7%, n=37) had a family history of at least one NCD. None of the participants were current smokers, and only one participant ingested alcohol ≥3 units per day (Table 1).

Table 1. Demographics of the study group

Demographics	*Percentage(n)*
Highest level of education	
Graduate	1.6% (1)
GCE A/L	19% (12)
GCE O/L	52.4% (33)
Grade 5	27% (17)
Monthly Income	
≥ Rs. 10, 836	14.3% (9)
Rs. 10, 837 - Rs. 30, 814	34.9% (22)
Rs. 30, 815 - Rs. 45, 000	17.5% (11)
Rs. 45, 001 - Rs. 83, 815	6.3% (4)
Not disclosed	27% (17)
Physical exercise frequency	
No regular physical exercise	77.8% (49)
Regular physical exercise regime	22.2% (14)
≥ 5 times per week	9.5% (6)
4-5 times per week	7.9% (5)
2-3 times per week	3.2% (2)
once per week	1.6% (1)
Family history of NCD (overall)	58.7% (37)
Diabetes mellitus (type 2)	30.2% (19)
Hypertension	28.6% (18)
Dyslipidaemia	17.5% (11)
Ischaemic heart disease	9.5% (6)
Stroke	6.3% (4)

Mean (+/-SD) BMI was 27.26 (±5.12) kg/m^2. An overwhelming majority was overweight or obese (85.3%, n=52) and had central obesity (73.9%, n=34). Majority of both pre-menopausal (88.89%, n=16) and post-menopausal (83.72%, n=36) group were either overweight or obese.

On examination 36.8% (n=21) were found to be hypertensive, and 44% (n=21) had elevated fasting blood glucose levels. The lipid profile revealed that 33.9% (n=20) had high total cholesterol, 31.7% (n=19) had high LDL cholesterol and 6.8% (n=4) had high triglycerides. None of the participants had low HDL (Table 2).

Table 2. CVD risk factors: examination and investigation findings

Variable	*Percentage (n)*	*Mean ± SD*
BMI		27.26 (±5.12) kg/m^2
Obese (≥25 kg/ m^2)	65.6% (40)	
Overweight (23 -24.9 kg/ m^2)	19.7%	
Normal (18.5-22.9 kg/ m^2)	(12) 9.8% (6)	
Underweight (<18.5 kg/ m^2)	4.9% (3)	
Waist circumference		88.78 (±13.9) cm
High (≥80 cm)	73.9% (34)	
Normal (<80 cm)	26.1% (12)	
Blood Pressure		SBP: 135.61(±14.97) mmHg
		DBP: 78.70(±8.69) mmHg
Hypertensive (≥140/90 mmHg)	36.8% (21)	
Pre-hypertensive (SBP=120-139/ DBP=80-89 mmHg)	45.6% (26)	
Normal (< 120/80 mmHg)	17.5% (10)	
Fasting blood glucose		109.55 (±35.48) mg/dl
Diabetes mellitus(≥126 mg/dl)	20% (10)	
IFG (100-125mg/dl)	22% (11)	
Normal (<100 mg/dl)	58% (29)	
Total cholesterol		218.61 (±48.95) mg/dl
High(≥240 mg/dl)	33.9% (20)	
Borderline high(200-239 mg/dl)	28.8% (17)	
Desirable (<200 mg/dl)	37.3% (22)	
LDL-c		141.01 (±43.60) mg/dl
High (≥160 mg/dl)	31.6% (19)	
Borderline high (130-159 mg/dl)	23.3% (14)	
Near optimal/ above optimal (100-129 mg/dl)	25% (15)	
Optimal (<100 mg/dl)	20% (12)	
HDL-c		49.12 (±4.39) mg/dl
High(≥60 mg/dl)	3.6% (2)	
Normal(40-59 mg/dl)	96.4% (54)	
Low (<40 mg/dl)	0	
Triglycerides		139.86 (±34.33) mg/dl
High(200-499 mg/dl)	6.8/% (4)	
Borderline high(150-199 mg/dl	27.1% (16)	
Normal (<150 mg/dl)	66.1% (39)	

BMI: Body mass index, SBP: Systolic blood pressure, DBP: Diastolic blood pressure, LDL-c: Low-density lipoprotein cholesterol, HDL-c: High-density lipoprotein cholesterol, IFG: Impaired fasting glucose, NCD: Non-communicable diseases

Majority of the study participants were apparently well women, with approximately 1/3rd of the participants reporting to have been previously diagnosed with a NCD related to CVD risk. Dyslipidaemia, hypertension and diabetes mellitus was newly diagnosed during the study in 17.5% (n=11), 20.7% (n=13) and 8% (n=5) respectively. Majority (52.4%, n=33) fulfilled the IDF diagnostic criteria for metabolic syndrome and 61.11% (n=11) of the pre-menopausal group and 48.89% (n=22) of the post-menopausal group were diagnosed with metabolic syndrome (Table 3).

When comparing pre-and post-menopausal groups, there was a significant increase in overweight/obesity (p=0.015), LDL (p=0.033), prevalence of diabetes mellitus (p=0.000) and ischaemic heart disease (p=0.005) in the pre-menopausal group whereas total cholesterol level (p=0.004) and the prevalence of dyslipidaemia (p=0.006) was significantly increased in the post-menopausal group. (Table 4) Additionally, selected examination and investigation variables (waist circumference, BMI, blood pressure, total cholesterol and LDL-c)was higher in the pre-menopausal group though not statistically significant. (Table 5).

Table 3. CVD risk factor (NCD) prevalence in the study group

CVD risk factor	*Self-reported prevalence*	*Newly diagnosed within the study*	*Final cumulative prevalence (self-reported + via examination/investigation)*
Dyslipidaemia	33.3% (21)	17.5% (11)	50.8% (32)
Hypertension	22.2% (14)	20.7% (13)	42.9% (27)
Diabetes mellitus	19% (12)	8% (5)	27% (17)
Ischaemic heart disease	7.9% (5)	0	7.9% (5)
Stroke	3.2% (2)	0	3.2% (2)
Metabolic syndrome	NA	52.4%	52.4% (33)

Table 4. Comparison of variables between the pre and post-menopausal groups (chi-square test)

Variable	*Post-menopausal percentage(n)*	*Pre-menopausal percentage(n)*	*p*
Overweight/obesity	83.72% (36)	88.89% (16)	0.015
Central obesity	68.75% (22)	85.71% (12)	0.7074
Hypertensive (on examination)	34.15% (14)	43.75% (7)	0.456
Diabetic (according to FBG)	24.32% (9)	7.69% (1)	0.786
High total cholesterol	34.15% (14)	33.33% (6)	0.004
High LDL-c	30.95% (13)	33.33% (6)	0.033
High triglycerides	9.76% (4)	0	0.656
Final cumulative NCDs			
Dyslipidaemia	51.11% (23)	50% (9)	0.006
Hypertension	40% (18)	50% (9)	0.525
Diabetes	26.67% (12)	38.46% (5)	0.000
Ischaemic heart disease	6.67% (3)	11.11% (2)	0.005
Stroke	0	11.76% (2)	2.351
Metabolic syndrome	48.89% (22)	61.11% (11)	0.770

FBG: Fastingblood glucose, NCD: non-communicable diseases, LDL-c: Low-density lipoprotein cholesterol

Table 5. Comparison of means of variables between the post and pre-menopausal groups (t-test)

Variable	*p*	*t*	*df*	*Post-menopausal (Mean ± SD)*	*Pre-menopausal (Mean ± SD)*
Waist circumference (cm)	0.338	-0.969	44	87.47±14.06	91.79±13.54
BMI (kg/m^2)	0.386	-0.874	59	26.89±5.26	28.14±4.80
Systolic BP (mmHg)	0.494	-0.689	55	134.76±15.08	137.81±14.94
Diastolic BP (mmHg)	0.169	-1.394	55	77.71±8.23	81.25±9.57
FBG (mg/dl)	0.432	0.792	47	111.97±36.07	102.85±34.27
Total cholesterol (mg/dl)	0.986	-0.017	57	218.54±53.38	218.78±38.33
LDL-c (mg/dl)	0.991	-0.012	58	140.97±47.26	141.11±34.79
HDL-c (mg/dl)	0.297	-1.053	54	48.718±4.68	50.06±3.56
Triglycerides (mg/dl)	0.760	0.307	57	140.78±37.22	137.78±27.45

BMI: Body Mass Index, BP: Blood Pressure, FBG: Fasting Blood Glucose, LDL-c: Low-density lipoprotein cholesterol, HDL-c: High-density lipoprotein cholesterol

Discussion

The preliminary findings of this study reveal that there is a high prevalence of CVD risk factors during menopause transition and after menopause, namely, dyslipidaemia, hypertension, diabetes mellitus and metabolic syndrome. In Sri Lanka, the highest prevalence of diabetes in women has been reported in the 45 - 65 year age group[23], which more or less correlates with the same group identified in our study. However, we found no local studies on the CVD risk factor prevalence of women conducted with menopausal state taken into account.

In this study, it was apparent that there was a significant increase of the prevalence dyslipidaemia and level of total cholesterol after menopause. This is corresponding to the results of previous studies conducted in the South Asian region[33-35] and also worldwide[36,37], where it was found that menopause was associated with unfavourable effects on lipid and lipoprotein metabolism, with significantly increased levels of total cholesterol, LDL-c and significantly decreased levels of HDL-c found after menopause. This could imply that the predominant reason behind the increased prevalence of CVDs after menopause is lipid derangement. However, in our study, the level of LDL-c was significantly increased in the menopause transition group. This could be due to the increase in cholesterol of women preceding natural menopause by 3 years, as shown byAkahoshi et al[38].

Prevalence of metabolic syndrome was similar tothat of an Indian population[39]. Additionally, the presence of metabolic syndrome also showed a rising trend in the pre-menopausal group in our study, and no significant increase in prevalence was shown after menopause. This is contrasting to the findings of Pandey et al.[40], who found that the prevalence of metabolic syndrome was significantly higher after menopause. However, they also concluded that there was no significance when the data is adjusted for age, implying that it could be more of an effect of ageing and increased androgenicity, rather than oestrogen depletion. A local study demonstrated that the prevalence of metabolic syndrome significantly increased with increasing age in Sri Lankan females[24]. Similar findings were reported in a North American study, which showed that the prevalence of the metabolic syndrome increased after the third decade and reached a peak in women aged 60 to 80 years[41]. However, both these studies have not considered the menopausal state.

Furthermore, the findings illustrate the overwhelming presence of modifiable risk factors for CVD in this group of semi-urban Sri Lankan women, namely obesity, central obesity and sedentary life style. There was a significant increase of those with a BMI≥25 kg/m^2 among the premenopausal women. In contrast, Dosi et al[33] reported that obesity was significantly increased after menopause. This change could be attributed to the increasingly unhealthy lifestyle development in the recent years leading to obesity at a younger age. This could be especially due to the semi-urban area where our study group resided, with greater access to takeaway food outlets, and it has been shown environments as such are obesogenic-environments[42].

Majority of women (77.8%) in our semiurban population lacked regular physical exercise. In a similar study conducted in a rural population of India[42], the prevalence of the cardiovascular risk factors was lower than in our study. This could be attributed to the difference in the level of physical activity between the two study groups, as in the Indian study, only 55% led a sedentary life. It has been found that women with low physical activity would benefit by even slightly increasing their physical activity, for example, by at least walking for one hour per week, and would also benefit more from additional activity[42]. Janssen et al.[42] demonstrated that the addition of combined aerobic and anaerobic exercise and an energy-restrictive diet is beneficial for overweight postmenopausal women, and has a positive effect on cardiovascular risk factors. Therefore, the same could be implemented on the study group as a simple intervention, which would be beneficial in preventing CVD.

Another significant finding was that there is under-diagnosis of NCDs, especially of dyslipidaemia and hypertension. In this study, 20.7% of hypertensive patients and 17.5% of dyslipidaemic patients were undiagnosed until this screening programme. Delayed diagnosis of these NCDs would prevent optimal management of these conditions, as secondary prevention will be hindered and would result in multiple complications.Therefore, blood pressure measurement could be implemented as a simple, cost-effective method of screening, and can be done as an outpatient procedure. The findings also indicate the need for an annual screening process for NCDs inclusive of atleast the basic measures of measuring blood pressure, and investigations such as fasting blood glucose and lipid profile, especially for women with CVD risk factors. It is imperative to understand that this screening process should commence before menopause occurs, as according to the results of our study, by menopause most Sri Lankan women would have already been affected with at least one NCD.

Our findings also suggest transition of the mean age at menopause to a gradually younger age, as the mean age at menopause of this study was found to be 47.45 (±5.76) years, whereas in 1994 it was found to be 51.12 years [2]. This furthermore reiterates the emphasis we should put on the menopausal group of women in Sri Lanka, as women are spending a greater part of their lives after menopause presently than it was in the past.

The main limitation of this study is that as the sample size is low, the data might not be generalizable to the entire Sri Lankan female population during menopause transition and early post-menopause. However, the sample recruited is a representative group for the urban/semi-urban, middle income class Sri Lankans, which mainly constitute the Sri Lankan population, and inclusive of all ethnic/religious groups, which is a strength of this study.

Conclusion

Remedial interventions to modify CVD risk factors of obesity, high waist circumference and sedentary life style would aid in the prevention of NCDs in Sri Lankan women. The females at risk of CVD should ideally be identified at an early age, through well-planned screening programmes, which should commence before they reach menopause, to identify and modify risk factors through lifestyle modification. Such programmes will reduce under-diagnosis of NCDs and early detection will ensure optimal management and secondary prevention of complications. As it was identified that metabolic syndrome was highly prevalent during menopause transition and after menopause, it is of utmost importance that once a patient is found to have a single criterion of metabolic syndrome, such as central obesity, to actively look for the other factors.

First contact care medical officers have a vital role to play, identifying these modifiable risk factors and addressing them as early as possible, and thereby implementing primary and secondary prevention of CVDs.

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The use of dried carica papaya leaf capsules in dengue fever patients in the recent dengue epidemic in June – August 2017

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Sri Lankan Family Physician, 2017, **33**, 21-26

Introduction

Dengue is a mosquito-borne infection, which is transmitted from person to person by *Aedes aegypti* and *Aedes albopictus*[1]. In the recent decades, it has become a major international public health concern. Dengue is found in tropical and sub-tropical regions around the world, predominantly in urban and semi-urban areas[1]. In Sri Lanka, dengue is now spreading to rural areas and has reached epidemic proportions and is a major public health concern.

Dengue Haemorrhagic Fever (DHF), thought to be a potentially lethal complication of dengue fever, was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand[1]. Today DHF affects most Asian countries and has become a leading cause of morbidity and mortality among children as well as in adults[1].

There are, though somewhat related, four distinct serotypes of dengue virus. Recovery from infection of one serotype could provide lifelong immunity against that particular serotype, but confers only partial and transient protection against subsequent infection/s by the other three serotypes. There is unequivocal evidence that sequential infection increases the risk of developing DHF[1].

To date there is no specific treatment for dengue fever. Unlike HIV therapy, lack of adequate global interest and limitations in funding in developing countries greatly hamper the development of therapies for dengue fever[2]. In the absence of western medicine and interest of general public towards herbal medicine especially in the southeast region, researchers looked in to possible herbal remedies.

Carica Papaya (Family Caricaceae) originated in Central America. The Papaya is a small tropical tree with a straight stem marked by scars where leaves have fallen directly from it. Papaya does not have branches. The Papaya fruit is pear-shaped with a bright golden-yellow skin when ripe. The flesh of the fruit is bright orange-yellow, juicy and silky smooth, with a sweet and sour flavor. The shiny gray or black seeds in the interior of the fruit have a peppery taste and are edible, although they are usually discarded. The Papaya is an extraordinarily useful plant. In the tropics ripe Papaya fruit is consumed as a breakfast fruit. Its juice is a popular beverage. The leaves and young stems are steamed and served as a vegetable. In some Asian countries, young leaves of Papaya are steamed and eaten like spinach. Yet in other countries Papaya leaves are brewed as tea and taken as a preventative measure against Malaria[3,4].

Salutary Effects of Carica Papaya Leaf Extract in Dengue Fever patients was published in the *Sri Lankan Family Physician*[5] in the 2008 edition of the journal. This study is most likely to be the first ever scientific biomedical study conducted to discover the salutary effects of Carica Papaya leaf extracts in patients suffering from dengue fever, reported in the world literature[5-7].

Following this study many research studies including humans and animals have been done world over including randomized controlled clinical trials and toxicology studies[8]. All have shown beneficial effects with no major adverse effects[9-16-19]. In these studies, researchers have shown that Papaya leaf extract is effective in reducing the number of days of illness, hospital stay and prevention of conversion of dengue fever to dengue haemorrhagic fever, reduce the incidence of pleural effusion thereby reducing the plasma leakage. It has also shown to increase the platelet count and the white blood cell count[5,9,20].

The author as the principal investigator has already conducted an open labelled randomized controlled trial at Colombo South Teaching Hospital, Kalubowila[20] and in 2016 College Oration was delivered by the author based on this study[21].

Many clinicians were under the impression that Papaya leaf only raises the platelet count without improving the disease process. But many studies done with large sample sizes have not shown only a solitary rise in the platelet count without patients' condition being improved. The rise in platelet count observed in patients taking Papaya leaf extract is due to the overall improvement in the disease process[22]. Shift in the Th1 immune process to Th 2 type immune reaction in DHF is thought to be a factor leading to unfavourable immune reactions resulting in plasma leakage. Research has shown immuno-modulatory effects of Papaya leaf extract stimulating the

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Th^1 immune process, thereby preventing the immune shift to Th^2 type reaction[19].

Papaya leaf capsules, syrups and tablets are now used in many countries for the treatment of dengue fever[23]. Few products are now available in the Sri Lankan market too. The author holds the patent rights for three processes in making Papaya leaf syrup, tablets and capsules for the treatment of dengue and other medical conditions. He also won the first place for the best medical invention 2013 at the presidential award ceremony held on 2016 for his invention called PAPAYACAP (Dried Papaya leaf capsules)[24]. According to its manufacturers during the recent epidemic of dengue fever from 1st of June to 31st August 2017 total of 385 bottles each containing 30 capsules were given to patients. All these patients were given the authors' contact number and details to contact him for advice. Out of these 50 patients took the Papaya leaf capsules directly from authors' medical clinic under his supervision and guidance. Patients used this patented product on their own seeking and some as recommended by doctors.

PAPAYACAP contains 360mg of dried Papaya leaf powder manufactured in an Ayurvedic authorised factory using strict quality controls. The product was tested at Industrial Technology Institute (ITI) for chemical and microbiological parameters and approved for its suitability for consumption.

Main objective

The main objective of the study was to describe the efficacy and the safety profile of dried Carica Papaya leaf capsules in patients diagnosed with dengue infection.

Method

Study Design: Descriptive study

Study duration: 1st of June to 31st of August 2017. During this period there was an epidemic of Dengue fever with highest number of reported cases in the history of Sri Lanka. According to the Epidemiology Unit, the reason for this epidemic was due to the introduction of new dengue strain type II into the country that was not common in Sri Lanka before[17].

Study setting: Dermae Research Medical Centre, which is a government approved medical centre situated at Maharagama and the authors general practice.

Study population: All patients who bought Papaya capsules during the study period. Patients came from all over the country. Addresses and contact numbers of all patients who requested for Papaya leaf capsule were noted.

Study sample: Fifty patients who were NS1 positive were followed up using a specially designed check list to collect the data.

Preliminary consultation

All patients were advised to take one to two capsules six or eight hourly depending on the stage and the severity of the condition of the disease. All patients were informed to continue their normal medication as recommended by their doctor and also to inform their doctor about the use of Papaya leaf capsules. They were also informed to get admitted to hospital if the platelet counts came to 15000. A printed leaflet distributed by the Ministry of Health, Dengue Control unit containing instructions for patients who are not admitted to hospitals was handed over to the patients[17]. All were given authors contact number to contact him in any emergency.

Follow up

Patients were interviewed personally during their illness and later via the telephone. Data was also obtained from their hospital diagnostic card and available investigations.

The following details were noted on the check list.

1. Age and sex
2. First day of the illness
3. The number of doses taken by each patient
4. Number of days the patient has consumed Papaya leaf capsules
5. Day of the illness that the first dose was taken
6. Number of patients who got cured without admitting to hospital
7. Number of patients who were admitted to hospital
8. Number of patients who were admitted to Intensive Care Unit (ICU)
9. Number of patients who had dengue fever and dengue haemorrhagic fever
10. Side effects of the drug
11. Patients own feeling of the effect on their illness
12. Report of NS1 antigen test
13. Date of hospital admission

Dengue Fever and Dengue haemorrhagic fever status was obtained as given in the diagnostic cards with evidence obtained by Ultrasound scan of the abdomen and thorax and other bio chemical investigations.

Analysis of data

Analysis was done using excel sheet spread. Frequency distribution is shown in the results section.

Results

Out of 385 patients who purchased Papaya leaf capsules, 50 patients were monitored by the author. Descriptive data of 50 patients were analysed and shown below.

Age and sex distribution

Patients from age 2 to 63 had consumed Papaya leaf capsules. All patients were NS1 antigen positive. Highest incidence of consumption was in the 21 to 30 age group and lowest was in the 41 to 50. The mean age was 31.76.

Table 1. Age distribution of the total group

Age group	*Number of patients*	*%*
1-10	3	6%
11-20	10	20%
21-30	15	30%
31-40	10	20%
41-50	2	4%
51-60	7	14%
61-70	3	6%

Sex distribution

In the study group 60% of males and 40% of females have consumed Papaya leaf capsules. This shows a male predominance.

Table 2. Sex distribution

	Number of patients	*%*
Male	30	60%
Female	20	40%

Frequency of dosing

The dose of administration had varied according to age and severity of disease. Majority of patients have taken 2 capsules 3 times a day. 72% patients have taken the first dose before admitting to the hospital and 28% had taken first dose in hospital.

Table 3. First dose taken at home or at hospital

First dose taken	*Number of patients*	*%*
Home	36	72%
Hospital	14	28%

Table 4. Frequency of consumption

Dosage	*Number of patients*	*%*
2 capsules 3 times a day	36	72%
2 capsules 4 times a day	6	12%
Other	8	16%

Total number of capsules consumed by each patient

Majority had consumed 30 capsules during the illness.

Table 5. Total number of capsules consumed

Number of capsules	*Number of patients*	*%*
30	33	66%
24	8	16%
12	5	10%
15	3	6%
6	1	2%

The day of the illness that patient has first consumed PAPAYACAP

Large number of patients has consumed Papaya leaf capsules in first 3 days of illness.

Table 6. Day of the illness first dose was taken

Day of the illness	*Number of patients*	*%*
1	9	18%
2	18	36%
3	7	14%
4	4	8%
5	4	8%
6	3	6%
7	4	8%
14	1	2%

Hospital admission

A large number of patients had been admitted to hospitals. They were advised hospital admission if the platelet count drops below 150,000 Cuml.

Table 7. Number of patients who were admitted to hospital

	Number of Patients	*%*
Admitted to hospital	42	84%
Not admitted to hospital	8	16%

Dengue fever (DF) and Dengue haemorrhagic fever (DHF)

The ultra sound scan had been performed in all admitted patients and the diagnosis cards indicated whether they were Dengue or DHF patients. All patients who were not admitted to hospital were considered as dengue fever patients.

Table 8. Dengue fever (DF) and Dengue haemorrhagic fever (DHF)

	Number of patients	*%*
Dengue haemorrhagic fever	9	18%
Dengue fever	41	82%

Admission to ICU for treatment

Out of total 50 patients who consumed Papaya leaf capsules only 2 patients needed ICU care. There were no reported deaths.

Table 9. Number of patients in ICU treatment

	Number of patients	*%*
Admitted to ICU	2	4%
Not admitted to ICU	48	96%

Side effects

Out of 50, only 2 patients complained of side effects. Both mentioned that they felt faintish while on Papaya leaf capsules. One patient has reduced the dosage yet continued with the medication while the other patient has stopped. No patients had major side effects.

Considering the fact authors personal contact number was given to all 380 patients who consumed Papaya capsules author did not receive any major complaints, adverse effects or deaths among these people.

Patients impression towards Papaya leaf capsules

Patients were asked whether they felt any improvement while using Papaya leaf capsules and whether they would recommend this medication to any other. 100% of patients said yes.

Table 10. Patients impression on Papaya leaf capsules

	Yes	*No*
Improvement felt	50	0
Would recommend to others	50	0

Discussion

In 2008, Author first observed that Papaya leaf extract was useful in the management in Dengue fever. The first ever-scientific Bio medical study was published in 2008 in *Sri Lankan Family Physician* by the author[5] and this was reported in Sri Lankan website *Lanka Puwath* and shared in many websites in the world including Cable News Network (CNN) news[25]. A letter to the Editor of the *British Medical Journal* (*BMJ*)[6] about the studies done by the author was published in the *BMJ* citing the link to the article that was published in the *Sri Lankan Family Physician*[5]. Papaya leaf extracts are now being widely used in many countries as capsules, tablets and syrup[22].

Three hundred and eighty patients sought to use Papaya leaf capsules during the recent epidemic. Out of these 385, 50 patients were followed up. Reason for large number of patients embarking on this treatment would have been due to the wide publicity, given in the web and in the local newspapers[26]. Many family physicians and other consultants had advised their patients to use this following the research data available [5-16,26,27,28].

When considering age distribution, and the incidence of side effects, even though there were children from year 2 to elders of 63 years, only one person discontinued taking the capsules due to side effects.

Mean number of capsules taken by patients is 25.86. This shows that adequate dose had been taken for the required time period. Large numbers of patients (68%) have consumed the capsule during the first three days of the illness. This probably indicates that there was sufficient time for this dried Papaya leaf capsules to have its effect on the disease.

Seventy two percent (72%) of patients had taken the first dose at home before entering the hospital and 28% had taken the drug while in the hospital. 84% of patients had been admitted to hospital and 16% had recovered without getting admitted to the hospital. Of the 80% who had been admitted to hospital only 18% developed Dengue haemorrhagic fever. Only two patients (4%) needed ICU care. There were no reported deaths in the study group. This adds on to the present evidence of the efficacy of Papaya leaf in the management of Dengue infection[14,18,20,23,27,28].

All patients believed that Papaya leaf capsules were helpful in recovering from their illness and that they would recommend it to other patients. This observation further strengthens the findings of the safety profile of the preparation[14,18,20,23,27,28].

Limitations

This is a descriptive observational study and the data were collected by interviewing the patient, perusing

the available medical reports and diagnostic cards. Close monitoring of the patients and day-to-day data were not gathered. Patients were managed in different hospital settings though advised to manage uniformly according to the dengue guidelines. The management of each patient may have differed. The reliability whether the patient exactly took the medication was dependent on the information given by the patients.

Recommendation and observations

It was observed that many people had faith and trust in this herbal medicine. Only two patients needed ICU treatment and very few side effects were reported and no deaths have been reported. This study has shown the safety profile of Papaya leaf capsules as in other studies[14,18,20,23,27,28]. A large scale placebo control, randomised trial could be recommended to further study it effects on preventing conversions of Dengue fever to Dengue haemorrhagic fever.

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The role of a general practitioner in improving women's health

Shreen Wilathgamuwa[1]

Sri Lankan Family Physician, 2017, **33**, 27-33

Introduction

A few years after graduation I decided to pursue my career as a General Practitioner (GP) given the unique accessibility a GP has to patients. As a woman GP, I quickly realized that women/mothers very rarely gave priority to their health /personal needs. Eventhough their wellbeing is of paramount importance for the enhancement, functioning and resource mobilization of their families. As my career progressed, I developed special interests in the areas of Sexual/Reproductive Health (SRH) and also in the behavior of people to specific situations. I then realized that there was an unmet need for women in family settings. From then onward I tried to make a difference in the life of the women I encountered professionally, as most women did not openly discuss issues related to these subjects. Strategies were developed to achieve my goal of improving women's health at primary care level.

During my career, spanning over 40 years I worked in several different settings as – institutions, hospitals and at my GP consultation practice. As a GP I designed my programmes and activities incorporating my special interests to suit the needs of the Institutions I worked for and the community I lived in.

I will include my version of a model of the well-known Family Practice Values and Principles that helped me in my work.

E.g. Community based health promotion/prevention –

- Involvement of area leaders as community forum leaders, police, religious dignitaries, Grama Sevaka, Medical officer of Health (MOH) etc.
- Links to State sector for updates, advice, participation.
- Most programmes ongoing due to said links.

Community based primary care

The very 1st project in the early '70s was to help at a free weekly medical clinic as a team member in an urban slum area. Services offered were curative and preventive care with health education. With time some household needs of the families were met by our team. We learnt that the husbands and fathers then had extra money to engage in alcohol /substance abuse and gambling as our team took on a part of their responsibilities. This project was stopped with heavy hearts after 2 yrs.

Dr. Shreen Wilathgamuwa

Learning experience

- 'Doing good' in terms of offering free services can have long term negative repercussions
- The insight to change my strategies for the future so that while going forward to re-evaluate strategies and change them for the best results.

Kusum Sevana Community Centre

My 2nd project was when I joined the Bloemendhal Development Society, Colombo13, in 1982. The aim of this project was to uplift living standards of the area people by conducting training programmes to generate an income for the parents and provide a preschool for the children.

Kusum Sevana – Houses a free Pre School for under privileged children in Bloemendhal Road and a Crèche/ Day care for the children of working mothers. There are 5 teachers and 2 nuns working at the Centre. A Scout Group, English and Maths classes after school for older children. This is a successful ongoing project to date. Voluntary donations and an annual raffle draw helps to fund the needs of the Centre. In the early years overseas donations

[1] *Family Physician.*

and fund raisers contributed to the upkeep of Kusum Sevana. Earlier there were app. 100-150 children. At present there are 85 students according to the Govt. rule of teacher/ student ratio. The children are provided with uniforms, school requisites and a wholesome meal daily.

Some of the skill development schemes that were conducted over the years for women and men were weaving, sewing, carpentry, boxes for packing tea, driving, envelope pasting at home are a few of the schemes. Always reputable teachers were involved. Some voluntarily and others had to be paid. The Mother's Union was given a tent and 100 chairs to hire out for functions/funerals. The income generated could be taken as loans by the members at zero interest.

The learning experiences were many and some unbelievable. On a lighter vein for the driving programme there was a lot of planning as the three wheel drivers selected were trained at the Central Transport Board (CTB) training school. The participants had to be paid an allowance as they lost their income for half a day during the training. All 3 trainees in the 1st batch failed the test. The reason – they did not know how to read or write. We had to teach them this skill in order to pass the driving test. We were smarter for the 2nd batch. The Mother's Union project of hiring the tent had problems as loans were taken only by the office bearers.

Health promotion /prevention activities –

- Cancer Screening for Women at Kusum Sevana – The then Director Cancer Hospital Maharagama and Director National Cancer Control Programme spearheaded the screening team with the participation of the area MOH. A predesigned questionnaire to obtain basic information was used. Pap smears and breast examinations were done. There were just over 100 participants. The 3 suspicious Pap smear reports were followed up by the MOH of the area.

- Health education discussions – The 1st talk on Puberty, Reproductive Health and Contraception was very popular. Thereafter the interest waned. Ultimately only the Rev. Sister and myself were present. Subsequently for health talks a sponsoring organization was arranged to give the participants some consumables as a take away.

Learning experience –

Adults

- Interest to learn short lived
- Expects gains immediately
- No consistency in activities to improve self

At present we continue only with the programmes for the children.

Mel Medura (centre for persons addicted to alcohol/ drugs)

From the inception in 1984, I helped out at the 6 week inpatient rehabilitation programme for alcohol abuse. My task as a GP was to look after the day to day ill health issues. After 2-3 years our approach changed as clients requested consultations for trivia. Then they were taken walking to outpatient department (OPD) of National Hospital of Sri Lanka (NHSL). The requests decreased drastically due to the walk in the hot sun and long wait at the OPD.

During the early years a success was considered only if there was 100% abstinence from alcohol. Later on an improvement in the quality of life was considered a success.

In the next phase instead of the inpatient programme a day care programme with clients coming from home was found to be more beneficial.

Always family support and counseling were given by the Mel Medura team. The close links with the Mel Madura team benefited my clients and their contacts too. The women were helped to deal with abusive relationships, they were empowered to pursue decision making pathways.

Elderly Care Clinic – Rawathawatte Methodist Church, Moratuwa

In the late '80s this clinic commenced and is still on going every Poya day. Prior to commencing, the assistance of area GPs was sought to help out by seeing one person free daily. My contribution was to organize and give the technical inputs initially.

Community based health promotion/prevention

Involvement in organizing discussions, lectures has been consistent throughout. Topics usually were on Family Wellness, Healthy Lifestyle, Puberty/Sexual Reproductive Health to suit the audience.

Beneficiaries –

- Schools – To overcome barriers from teachers/ parents a few days before the programme each child is asked to write down 5 questions that they need answers for.

  These are put into a sealed box. The programme is to answer these questions. Always these programmes proceed very well.

- Community Forums.
- Premarital couples – Churches organize such programmes on an on going basis.
- Free Trade Zone Katunayake – For workers, administrators and Medical Clinic staff.

I always incorporated certain values and principles in everyday work. However I felt there was a need to equip myself with new skills. I was fortunate to have had the opportunity to work at the "Therapeutic Community" Hillingdon Hospital, Uxbridge, United Kingdom with Dr. Roger Freeman (subsequently he became the advisor on Mental Health to the British Govt/Parliament). An important highlight during this time was being nominated to attend a 2 week training workshop by Masters and Johnson. 35 yrs ago this was quite an experience. I had not heard of surrogate therapy for sexual problems. A few years later in 1983, I joined the 2nd Diploma in Family Medicine (DFM) batch. I consider continuing medical education to be of utmost importance, in order to be current in knowledge keeping in mind that most GPs work alone.

During the DFM training the importance of family practice principles were ingrained into the participants. I made sure to always incorporate these values into my work. This is a brief summary of the requisite guidelines and ethics adhered to in my practice.

Comprehensive family care

Continuity of care

Hoslistic care

Health education (Prevention/promotion)

Record keeping

Confidentiality

Advocacy

Person centered relationship based approach

Sharing decisions

Work experiences

At the National Carrier – Air Lanka/Sri Lankan Airlines – UL (1981-2002)

Within the occupational health requirements I worked on several projects.

FP principle: continuity of care – record keeping – confidentiality – health education

How – Within an occupational setting a Family Practice (FP) was set up with record keeping, continuity of care, confidentiality and counseling. An emphasis on women's issues was fostered.

Links with the State sector relevant departments benefitted staff with updated information, processes and access to expert care.

The health education programmes were voluntary and opportunistic for licensing process.

- **Fostering the importance of cancer screening:** In the early '90s a questionnaire was developed by the Director, Cancer Hospital Maharagama (CHM) and National Cancer Control Programme (NCCP) to screen staff over 35yrs for cancer related issues. The questionnaire requested basic information such as name, age, sex, family history of cancer, any concerns, previous screening. Monthly a designated section of staff were screened by a team from CHM and self after staff filled the questionnaire. A breast examination and a Pap smear was done on all FP participants. The physical examination for male participants included a per rectal examination. Family Planning Association (FPA) analyzed the Pap smears which was cost effective. An awareness regarding cancer screening was fostered among the Airline staff. This was a monthly ongoing screening during my tenure at UL. Whenever a follow up was needed it was done by the CHM team.
- **Health education** – Was a voluntary and also an opportunistic situation. Health education programmes on topics relevant to the staff were done regularly. "How the body works" in relation to Puberty/ Reproductive Health was the most popular programme. Listening skills and how to respond to problematic situations was also popular.

  Regular training was mandatory for certain categories of staff to keep their work licenses current (opportunistic)
- **Information to airline crew on first aid:** The Book Health and Air travel was written and made available on all aircrafts. First Aid and other relevant topics were included in this book to deal with passenger requirements/emergencies on flights.
- **Contributory Hospitalization scheme for staff and families –** This was appreciated and helpful to staff as they were able to obtain the best care available with guidance.
- **Counselling** – was readily available to staff.
- **Links with State sector** –

  National Blood Bank – Annual Blood donation campaign on 1st Sept for the Airline anniversary. This was a popular programme where the airport

staff – Customs, Immigration and others also participated. This link was beneficial to both parties. Specially during the terror attacks the Airline was able to help out at immediate notice with emergency blood donation campaigns.

Wesak shramadana – Annually at the NHSL, Lady Ridgeway Hospital (LRH) or De Soyza Maternity Hospital (DMH) was a much looked forward to event. The technical teams attended to needs of the chosen ward a couple of weeks ahead of the due date. Cleaning, painting etc. were done on the set date.

This event fostered a team and family spirit with links to the hospital.

Family Health Bureau – Always assisted in women and child issues.

NCCP – Regarding cancer prevention.

At Family Planning Association – I was able to engage in my special interests full time.

FP principle: advocacy – health education – confidentiality – person centred approach, record keeping, comprehensive family care

How – Specific needs of clients attended too as contraception, sexual issues, cancer screening, subfertility in house and out house sites

Health education was at many levels including pre-marital advice, under graduate and post graduate teaching regularly.

Person centered care given at Sexual Health Clinic and NIMH Clinic.

Proper planning and awareness of stakeholders contributed to the success of programmes.

Some of my contributions were –

- **Commencing a Sexual Health Clinic in 2008 – FP Principles – Advocacy, Confidentiality**

  This clinic included a multidisciplinary team in 2008. Psychiatrist Dr. Kapila Ranasinghe (KR) who has special training in sexual health headed the team.

  Many clients with Gender Identity Dysphoria (transgender) and with different sexual orientations obtained advice. Information about the team/ services is mostly by word of mouth.

  I learnt that there were groups that assisted these people. eg Equal Ground, Diversity and Solidarity Trust (DAST), Companions on a Journey (Non functioning now), Women's Support Group, Heart to Heart etc. I work closely with these groups.

The requisite Guidelines adhered to when attending to clients with Gender Identity Dysphoria:-

DSMIV, DSM V and Good practice Guidelines of the Royal, College of Psychiatrists London Oct 2013.

These details are to create an awareness about this work.

A format was developed for recording history and follow-up visits by the team.

Rosenberg Self-Esteem scale is given to clients periodically.

The clients are seen at the NHSL clinic of Dr. KR or at my clinic.

Observations – Clinic attendance by clients is ad-hoc.

- Contact is sometimes over the phone once I am familiar with the client
- Many resort to self-medication of hormones via internet or peer advice
- Information given to doctors is limited/unreliable at times
- Family counseling sought by quite a few. Family members grateful as they feel lost and disturbed regarding their loved ones.
- Some reluctant to link with others with similar issues

Protocol for clients

- Psychiatric assessment
- Social/family stability encouraged. Follow up visits encouraged
- Occupation for a regular income needed. Options/ strategies discussed
- Advice to avoid risky behaviors
- Live the chosen life ie. preferred gender for 2 years prior to decision making and therapy
- Thereafter according to laid down guidelines

Assistance given for required documents – for security, travel etc.

All decisions taken solely by the client at their own initiation.

Our team is available to lend a listening ear and listen to the family mostly.

- **National Institute of Mental Health – (NIMH- Angoda) FP Principles – Person centered holistic care, Advocacy**

  A Sexual Health Clinic was commenced with the support of Dr. Jayan Mendis. Patients faced many difficulties when attending clinics at NH as – long waits, transport difficulties for other staff to transport a patient, patient uncooperative/fearful at times.

To overcome barriers awareness programmes for all NIMH staff approximately 800-900 staff including MOs, nurses and support staff.

Awareness lectures were conducted by State sector Medical officers (MOs); Reproductive health – by FHB, Sexually transmitted diseases (STD) – MO of STD campaign, behaviors due to different mental illnesses by MOs of NIMH.

A weekly clinic was conducted for staff and patients. As confidence was built the clinic was a success from the onset. Still it is ongoing weekly.

- **HIV positive persons**

  FP Principle – Advocacy

  – Close links with National HIV + ve Activists
  – Consultations, Counselling and referrals
  – Links with STD clinic NHSL and referrals to Infectious Diseases Hospital (IDH)
  – On Board of "Positive Womens Alliance"
  – Health Education talks – Healthy Lifestyle
  – Social support activities and assistance from donors periodically.

- **Jadelle –**

  FP Principle – Health Education, Person centered approach

After training in BKK awareness and lecture demonstrations in collaboration with Sri Lanka College of Obstetricians and Gyanecologists (SLOCOG) for doctors, nurses, paramedical staff and clients (State sector used Implonon at that time).

- **LISA** – "Life Saving" This was a project for internally displaced people (IDP) in the North and East funded by the UNFPA from 2007-2010.

  FP Principle – Person centered Holistic care, Health education

  FPA had field offices in Trincomalee, Batticaloa, Vavuniya, Chettikulam, Mannar and Ampara. Through these outlets support was given for the Government programmes for women and children conducted by the MOH offices. At the end of the war monthly hygiene packs, maternity packs for pregnant women at 28 weeks were prepared and handed over to the State officials for distribution. This task was handed over to the State Trading Corp shortly. FPA had 2 mobile clinic vehicles with water, electricity and examination facilities. Later 2 more were constructed. Field testing strip kits for blood sugar, haemoglobin etc. were provided. Later clinics were constructed in each Zone. Furniture was provided for the clinics.

Research / Books / Health Education

FP Principles – Health Education, Person centered approach.

How – Person centered needs attended to in the research projects.

The books were for health education giving a basic idea on how to move forward.

The book "Reducing the burden of Unsafe Abortion a Situational Analysis" was awareness of a National situation.

In all of these activities women's health was advanced both physically and psychologically eg. in an planned/ unwanted pregnancy, sub fertility women suffers and in my experience take the blame.

- **Research done – Sub fertility 2007** – A retrospective analytical study of couples with sexual problems presenting to a sub fertility clinic.

  – **Postinor** – In 2009 study at FPA on Emergency Contraception Users (ECP) calling on the hotline for advice. Poster presentation at College of General Practitioners of Sri Lanka (CGPSL) Academic Sessions.

  – **Pap smears** – A study was done in 2008 to evaluate whether there is a relationship between Pap smear reports and the effect of a contraception that was used.

  – **Thick condoms** – A study was done to evaluate the suitability of thick condoms by "Companions on a Journey".

  – **Vaginal practices in Sri Lanka** – This research was designed and commenced. I retired prior to completing the research.

Books authored –

– **Reducing the Burden of Unsafe Abortion a Situational Analysis-2008**
Co authored with Dr. Lakshmen Senanayake. This was a FIGO initiated international project

– **For a Happy Family** – Contraception

– **The Joy of a Baby** – Subfertility

– **Plan your Life** – Unplanned pregnancy and abortion

– **Unplanned / Unwanted Pregnancies and their aftermath** – A hand Book for GPs – a chapter on case studies.

- **Health Education – on SRH and Contraception**
  - Post Grad teaching
  - Under Grad teaching
  - Pre-marital classes
  - General public

At Hemas Hospital Wattala (HHW) – Here too I continued my work as a GP contributing to the hospital needs with a special emphasis on the unmet/little thought of needs in women.

FP Principles – Hospital (community) based health promotion and prevention, Health Education, Person centered care, Continuty of care, Record keeping, Confidentiality, Advocacy, holistic care.

How – Contact with clients own GPs giving a personalized care. Para medical services not found at GP clinics coordinated, Hospitalizations coordinated for GPs.

Similarly for sexual issues, HIV and Transgender clients personalized services.

Counseling and Continuity of care.

- GP Hospital Link was built up – Mainly the personal relationships with GPs and Consultants, especially those in the vicinity of the institutions. These links fostered a mutually beneficial referral systems.

Difficulties encountered –

a) Unknown GPs were uncomfortable to link with the hospital even with a dedicated coordinator

b) GPs unable to come for regular time slots to hospital – to link with para-medical services

c) Admissions to HHW only under a consultant

d) GPs not familiar with regular visits to inpatients at hospital and about their charges

e) With GP visits the hospital bill of patient will increase

f) Known GPs would refer patients for para medical services and hospitalizations. Coordination, information and referral back to them fostered this system.

- **Pap Smears** – Over a 1000 Pap smears were done from May 2007 to April 2014. The same Pathologist reported on all the samples. These clients were between 35-65 yrs, from urban areas came for routine screening. No adverse results were detected.

- **National Cancer Prevention Programme (NCCP)** – Close links with NCCP for guidance and assistance.

- Nirogi Paada programme – Participation gave the current updates on Diabetic foot care.

- **Health Education / Promotion Programmes** – Were done for Corporate clients/Companies, Public, Antenatal clients, Staff

  Topics – Healthy Lifestyle
  - Retirement Preparation
  - Pre-marital
  - Reproductive Health/Contraception
  - Articles – Print / Web

- **Introduced Alcoholics Anonymous (AA) to the private hospital setup** – Meetings were started in September 2013 on Sundays at 6.30 pm. The hospital provided an area for the meeting which is conducted by the members. This meeting is progressing well as clients find the environment secure and the numbers have doubled. This was the 1st AA meeting in a Private Hospital. AA meetings are held in many Govt. hospitals eg – Negombo, Minuwangoda etc.

- The most gratifying experience was that I became the unofficial counselor for the staff and later appointed officially as Staff Counsellor.

Work for CGPSL – DFM online and MCGP – Contraception and Sexual Health modules

Many GPs keep in touch after the lectures

Some unaddressed situations throughout – mainly woman centered

- **Contraception** – sensitivity to religious/cultural beliefs.
- **TOP** – How to respond in relation to the law of Sri Lanka.
- **Medical Hypnosis** – past 4 years where applicable for certain conditions.

Work related comments –

I wish to emphasize that I always found ways and means to find time to carry out projects that interested me within the framework of my work schedule. As, I always worked for an institution/hospital there were advantages as a fixed income, fixed work times, leave entitlements etc. which definitely helped me along the way.

Conclusions

- A special interest can be pursued and modified to suit the work environment.
- Continuing medical education is important for best practices.
- Family practice principles give value /protection to the patient and the GP.
- Sensitivity to the social religious background, the law of the land must be kept in mind when dealing with clients.

I am happy to share with all of you my message that whatever the working environment is, as a GP one is able to pursue special interests in order to assist our patients.

In my experience and as per my observation in this ever changing world.

As Gale Holtz Golden says "yesterdays perversion is todays deviation and tomorrows variation".

I take my role as to cure sometimes – to relieve often – and to comfort always…. keeping in mind, that this is what we doctors do most of the time.

Snippets

Weep not for what you have lost, fight for what you have.

Weep not for what is dead, fight for what was born in you.

Weep not for the one who abandoned you, fight for who is with you.

Weep not for those who hate you, fight for those who want you.

Weep not for your past, fight for your present struggle.

Weep not for your suffering, fight for your happiness.

With things that are happening to us, we begin to learn that nothing is impossible to solve, just move forward.

Immaculee Ilibagiza

Health and diplomacy

***Delivered by Dr. Ruvaiz Haniffa**, MBBS DFM MSc PgDip MD FCGP MRCGP, at the Regional Meeting of the Sri Lanka Medical Association held in conjunction with the Kalutara Clinical Society on Saturday 17th December 2016 at Hotel Blue Waters Kalutara*

Sri Lankan Family Physician, 2017, **33**, 34-38

Dr. Desmond Fernando
MBBS, FCGP, FAAFP
Family Physician
1930-2012

Bothalage Desmond James Stanley Fernando was born on 26th November 1930 to James Fernando and Mrs Mercia Fernando as the eldest in a family of three. He had his early education at St. Thomas Preparatory School Kollupitiya and Royal College Colombo and completed his secondary education at St Thomas College Mount Lavinia, with academic excellence. He entered the Faculty of Medicine, University of Colombo in 1948 on a university scholarship and passed out MBBS in 1954. Upon passing out he married Ms Sumana Hemalatha De Silva the same year and went on to have two children – Ms Sreeni Manohari Dalpatadu, Attorney-At-Law and Professor Devaka Fernando, Professor of Endocrine and Metabolic Health at the Post-Graduate University of Hallam, Sheffield, United Kingdom.

Dr. B D J S Fernando, a visionary in the field of General Practice in Sri Lanka was a multifaceted medical luminary who has been described by a contemporary of his as "*a lovable man, who achieved a lot, and whenever he was asked, helped fellowman in great measure*". He was a clinician, inventor, author, medical educationist, medical administrator, health ambassador and above all a true servant of the Sri Lankan medical profession.

The Clinician

He was in government service until 1958 – serving as DMO Elpitiya and DMO Minnuwangoda. He left government service to set up his own General Practice clinic in Ratmalana in 1958. During the mid-late 1960's until 1976, Dr. Fernando worked in the USA and the UK where he had the opportunity meet with the pioneers in Paediatrics and Family Medicine – the latter discipline was which he played such a big role in establishing as a clinical discipline in Sri Lanka in the early and mid -1980's. On returning to Sri Lanka in 1976 he resumed his practice which he continued till 2010 until his retirement from active practice.

The Inventor

Together with his colleague Dr. P T De Silva he developed a phonocardiograph which was produced locally. He developed a rubber band haemorrhoid ligator forceps and a cryosurgery gun for which he holds international patents. Designed and popularized the use of a locally produced Monofilament.

The Medical Author

Fourteen single author articles which were published in prestigious medical journals. He contributed to every issue of the *Sri Lankan Family Physician* with inspiring and unique papers since its first issue in 1979. He also published six Research papers and presented papers and participated in over thirty international conferences. Contributed chapters to the SLMA Guidelines on vaccines 1st to 4th Editions. The 5th edition of the SLMA Guidelines on Vaccines published in 2014 was dedicated to his memory. *Sri Lankan Family Physician* Vol 31(1) published in 2014 was dedicated to his memory

The Medical Educationist

As a founder member of the Board of Study in Family Medicine at the Post-Graduate Institute of Medicine (PGIM) of the University of Colombo in 1979 he was associated with planning and the implementation of the academic activities of the College of General Practitioners of Sri Lanka and (CGPSL) Independent Medical Practitioners Association of Sri Lanka for 3 decades. He functioned as the course coordinator, examiner and chief examiner of the Diploma in Family Medicine and MD (Family Medicine) exams at the PGIM. Helped the CGPSL and the PGIM to organize the training sessions for its members in achieving the arduous task of making teachers out of family doctors with the help of his overseas contacts in Family Medicine. He played the lead role in inculcating the culture of clinical teaching among General Practitioners in Sri Lanka by creating and institutionalizing the Faculty of Teachers (FoT) of the CGPSL.

The Medical Administrator

He was the President of the College of General Practitioners of Sri Lanka from 1993 to 1996 and served as the Vice President Independent Medical Practitioners Association of Sri Lanka. Held membership in many important Health Ministry Committees including – Drug Evaluation Sub Committee (DESC) and Advisory Committee on Communicable Diseases (ACCD). He has served as Honorary Advisor to the Minister of Health on Private Sector Health Services and played a lead role in conducting the DFM (and subsequently the MD Family Medicine) exam in Chennai, India (from 1999 until 2000). These to date remain the only Post Graduate Medical Examination to be conducted by the PGIM overseas.

The Health Ambassador

He was a pioneering member of WONCA (the World Organization of Family Doctors) from Sri Lanka and served on its Council. He led the largest Sri Lankan delegation of Family Physicians overseas to the Family Doctors Conference in Lahore, Pakistan in 1994. He used these attributes, among other issues, to make family medicine a recognized and respected academic discipline in Sri Lanka and the rest of the world, especially the Asia Pacific Region.

I did not have the privilege of personally meeting or knowing Dr Desmond Fernando, but as proud product of his vision to establish family medicine as a separate clinical discipline in Sri Lanka I am indeed honoured and humbled as a Family Physician to have been selected as the individual to deliver the 2nd Desmond Fernando Memorial Lecture today. I dedicate this lecture to the memory of this pioneering Family Physician.

Introduction

As stated in the World Health Organization (WHO) Constitution (among other principles) '*The health of all peoples is fundamental to the attainment of peace and security and is dependent upon the fullest co-operation of individuals and states*'. In today's multipolar world, power and influence are exercised by many different groups of states and non-state actors through many different channels at many different settings using many different mechanisms and techniques.

In this scenario, the measurement of the traditional 'Balance of Power' is no longer confined to military power alone (Hard Power). Soft and 'Smart' Power are playing a larger role in determining the 'Balance of Power' in regional settings in particular and global settings in general.

Health is an issue that crosses many of these boundaries of power because the inputs in to maintaining 'good health' and the outcomes of 'bad' health' are fundamentally universal and is only affected by the social determinants of health. These social determinants cause inequality in health status between and within countries which requires constant negotiation to make right. Negotiation is the operational word in Edmund Burke's classical definition of the term 'diplomacy' in 1796. Hence, the negotiation of health matters at intentional level requires an intimate knowledge of both health and diplomacy and the wider theoretical basis upon which diplomacy depends – International Relations.

Due to the trans-border nature of health issues today (Table 1) the solution to them require a multi sectoral approach. The fundamental question to be asked in dealing with these issue is *Are these health issues needing foreign and trade policy solution or are these foreign and trade policy issues requiring a health intervention?* Furthermore, *Does the Sri Lankan foreign, trade and health sectors have the capacity to deal with these issues either in isolation or collectively?*

Table 1. Examples of the trans-border nature of health issues

International scenario	*Sri Lankan scenario*
1. Eradication of small pox from the world in 1930	Eradication of Malaria – constant danger of resurgence due to high prevalence in the SAARC region
2. Marching toward eradication of polio from the global	TB – danger of increase in incidence and Prevalence due to influx of foreign labour
3. International Health Regulation (IHR) 2008	Kidney transplantation of foreign citizens in Sri Lanka
4. Framework Convention on Tobacco Control (FCTC) 2012	Health impacts of economic and technological cooperation agreements with other countries
5. Influenza Preparedness Framework 2010	
6. Trade Aspects of Intellectual Property Rights (TRIPS) 1990	

As discussed by Kickbusch and Kokeny in their paper Global Health Diplomacy: five years on[1] the following four elements have contributed to the ascent of global health diplomacy.

1. Foreign affairs ministries are becoming more involved in health because of its relevance for soft power, security policy, trade agreements and environmental and development policy.
2. The venues of health diplomacy are changing; many new actors outside the WHO have (health) diplomats.
3. Globalization; new donor-recipient relationships, new types of health alliances and rise of co-operation between low and middle-income countries have heightened the need for health diplomacy.
4. Need for competent health diplomats.

What is Health Diplomacy

There is no accepted definition for the term as yet. An analysis of the many definitions been used today identifies the global nature of the issue, multi stakeholder/ actor involvement, communication, interaction, negotiation, cooperation, and help and politics and decision making as the core themes of these definitions (Table 2).

Global health diplomacy has been practiced from ancient times as evident in the – Exchange of physicians between Royal Courts as gesture of good will, declaring ceasefires during war and conflict for health reasons (evacuation of dead, tend to injured), Informing the spread of Contagious Diseases in territories and restrict access to the territory, Use of health as means to spread religious and other ideology (Christian Missionary work in Africa) – This even lead to colonization and imperialism ! The modern evolution of the concept of global health is thought to have begun with the formation of the League of Nations and the office Office d'Hygiène Public (OIHP) in 1851 (Table 3).

Table 2. Selected definitions for Global Health Diplomacy

1. 'Multi-level, multi-actor negotiation process that shape and manage the global policy environment for health.' – *Kickbusch et al 2007*
2. 'A system of organization, communication and negotiation process that shape the global policy environment in the sphere of health and its determinants.' – *Kickbusch et al 2013*
3. 'Chosen method of interaction between stake-holders engaged in public health and politics for the purpose of representation, cooperation, resolving disputes, improving health systems and securing right to health for vulnerable populations' – *Health Diplomat 2007*

Table 3. Phases of development of the concept of Health Diplomacy

Phase I (1850s-1950s) *Institutional Foundations of Global Health*	"Golden age" –discovery of x rays, stethoscope, germ theory First International Conference on Sanitation 1851. Formation of League of Nations and Office d'Hygiène Public (OIHP). Private Philanthropy (Rockefeller Institute of Medical Research) , League of Nations Health Organization(1920) and WHO (1948)
Phase II (1970s-1990s) *Eradication and emergence of disease and rise of neoliberalism*	Eradication of Smallpox (1980). Alma Ata declaration (1978) Emergence of HIV/AIDS and the global response. Neoliberal reforms of health system (E.g. Privatization of the NHS in the UK)
Phase III (2000s) *Partnerships, Goals, Innovations and Pandemic Flu*	Public-private partnership at international level for health financing (GAVI, UNITAID and GFATM). MDGs. G8 and G20 communiqués on health, international celebrity involvement. Global security concerns due to H5N1 (2003) and H1N1 (2009). Concern over focused on "narrow" number of health issues resulting certain health situations to be ignored (War and health, Environment and health .....)

Basics for practice of Health Diplomacy

Due to the fact of current health issues being cross border in nature, multi stakeholder involvement and requiring an intra and inter disciplinary approach in addressing the issues, the model of 'traditional diplomacy' is incapable of fully addressing the issues to the satisfaction and benefit of all stake holders in an equitable manner. Hence a new approach was needed. This 'new diplomacy' describes shifts in foreign policy that challenge how diplomatic practice is carried out[2]. A core element in this shift as discussed by Lee and Smith, is the shift from highly trained officials within foreign ministries, to a border range of other actors who may not have formal training in the art and practice of international relations and diplomacy. These actors may include states, non-state actors, non-governmental organizations, multinational business entities, philanthropic organizations, political/ religious/ideological organizations or individuals.

'New diplomacy' is increasingly being shaped by non-state actors particularly with regards to health and diplomacy. These non-state actors have the financial clout at international level or grass root following at local level to influence health inputs and outcomes. E.g. Global Fund to fight AIDS, TB and Malaria (GFATM) – This fund receives aid from the Bill and Melinda Gates Foundation, GAVI (Global Alliance for Vaccine and Immunization)- Funded by vaccine producers plus specific initiatives funded by Gate Foundation, Global Polio Eradication Initiative – Rotary International.

In a more negative sense, these non-state entities may even influence and frankly be the cause of outbreaks of infectious disease. E.g. In 2003 the people of Kano state, Northern Nigeria began refusing WHO supported Polio vaccination based on rumors, echoed by local political and religious leaders that the campaign represented a Western conspiracy to sterilize the Muslim population (Similar situation is happening now in tribal areas of Pakistan and Afghanistan).

Issues such as war and health (inter and intra state conflicts, fragile states), human displacement and health, environmental health, antimicrobial resistance and the threat of bio terrorism are accentuating the need for 'new diplomacy' to have 'health diplomacy' as at least one of its pillars. This is *sine qua non* in the context of attainment of peace and security throughout the world.

The practice of health diplomacy within the frame work of the concept of 'new' diplomacy can be summarized in to three major areas

1. **Core diplomacy or Traditional diplomacy** – Formal negotiation between states.

   a. Bilateral treaties and agreements – Involves high level negotiations between national representatives (health or otherwise) Aims;

      – To secure reciprocal healthcare in each other's countries for citizens
      – For technical assistance
      – Funding for health-related projects

b. Multilateral treaties and agreements – Negotiations that come under aegis of multilateral institutions such as the WHO. These institutions lead the effort in shaping agreements and norms with consent and agreement of members. There are about 50 such multi-lateral agreements in the world today. Aims;

   – To tackle an identified health issue in a uniform manner taking in to account the epidemiological evidence

   – To develop standard operational best practices for health issues

   – To coordinate global effort in control of health issues

   E.g. Framework Convention on Tobacco Control (FCTC) / International Health Regulations (IHR) – Member states to develop and maintain core capacity to detect, assess, report and res-pond to public health events and promptly notify WHO of any public health emergency that might affect other nations.

2. **Multi stakeholder diplomacy** – International negotiations and interactions in which various states, non-state and multilateral actors work together to address common issues.

a. Partnerships between government agencies E.g. The Family Health Bureau of the Ministry of Health and Ministry of Education programme to improve child nutrition funded by the GOSL.

b. Global initiatives and International Organizations E.g. Global Fund to fight AIDS, TB and Malaria (GFATM) – This fund receives aid from the Bill and Melinda Gates Foundation, GAVI (Global Alliance for Vaccine and Immunization) – Funded by vaccine producers plus specific initiatives funded by Gate Foundation, Global Polio Eradication Initiative – Rotary International.

c. Counterbalancing Conflicts through Health Diplomacy. E.g. eradication of Smallpox during Cold War. Negotiated Ceasefires for health interventions during conflicts (One-day Polio Immunization during Sri Lankan civil war, Guinea Worm Ceasefire in Sudan 1995) – Concept of Health as Bridge for Peace as a strategic element.

3. **Informal Diplomacy** – Interactions between health and non-health professionals from different sovereign nations, other actors including the public.

a. Government Employees – Free agents in the field. E.g. US President's Emergency Plan for AIDS relief (PEPFAR) – requires US diplomats to implement and evaluate the plan. US Military personnel involved in health projects for research and humanitarian assistance programmes.

b. Private funders and NGOs – Gates Foundation – has disbursed $ 17 billion in medical assistance between 2002-6.

c. Research – Partnerships between individual and/ or institutions. Clinical trials funded by pharma-ceutical industry to test new medication (drugs, vaccines) – potential for 'health conflicts'.

d. Humanitarian Assistance and Disaster Response – 'Disaster Diplomacy'.

Conclusion

Health is a universal and cross cutting issue. Its effects, at the human level, are universal as well. Social Determinant of Health causes inequality in health status globally. In the modern era, these inequalities are aggravated and accentuated by health and non-health related issues (wars, conflicts, human displacement etc etc). This requires constant dialogue between nation states, non-state actors and myriad of other stakeholders on constant basis.

Though Health Diplomacy currently eludes definitional precision it is a mechanism to discuss/resolve health issues using the principles of International Relations, Foreign Policy and Diplomacy in a globalized world.

Health Diplomacy is becoming an increasingly prominent element in the foreign policy tool kit of state and non-state actors. It requires a delicate combination of technical expertise, legal knowledge and diplomatic skill to be effective to achieve its ultimate goal of improving global health status.

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Delivery of quality primary curative care with a vision: Training of General Practitioners in Sri Lanka

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Sri Lankan Family Physician, 2017, **33**, 39-41

It is well known that better primary healthcare leads to better population health at lower health care costs. And when there is a strong system of primary care in place in a country, and professionals are educated for their specific tasks, the performance of the system is improved[1]. In Sri Lanka we have the state based strong primary care preventive system which has an islandwide coverage with monitoring and evaluation which works towards achieving eradication of communicable diseases[2]. The health unit system was introduced in 1926 and a program was developed together with the International Health Board of the Rockefeller Foundation, based on standard public health concepts and measures[3,4]. This program became the framework and impetus for the remarkable achievements in public health in Sri Lanka. There are doctors specialty trained in public health or community medicine in the country who are now manning the health units presently named MOH areas.

The epidemiological and demographic transition we are experiencing now poses a different challenge. The present programmes in place are not sufficient to meet this challenge. It needs a whole person approach based on practice of principles of family medicine and an administrative structure and a referral system with secondary and tertiary care to strengthen the primary care curative system[5]. Models are at present being developed and discussed[6]. According to the recent statistics available, both state and the private sectors are responsible equally for delivery of ambulatory primary curative care[2]. However, in this primary curative care system unique to this country, every citizen is able to obtain primary care services from any state institution in any part of the country free of charge[7]. This facility by itself insures every citizen for health care by the state up to a certain level that the state can afford to provide free facilities. They also are free to access health services at a cost from the private sector. The most recent surveys on expenditure for health care show that the out of pocket expenditure for health services are high (40%) and this is mainly for services by the private practitioners, investigations and pharmaceutical products[8]. The surveys also show a rising trend in Non Communicable Diseases (NCDs) together with the mortality due to NCDs also in an increasing trend over the years[2]. It is also known that the ambulatory care services were responsible for a 100 million consultations for the year 2014[2]. Majority of these consultations are done by doctors with a license to practice for a lifetime or until they decide to retire without any need for quality assurance of a care giver[9]. One may practice for 40 years without any updating of knowledge and based on good doctor patient relationships and experience.

Let us now look at the training which licenses a doctor to deliver primary curative care.

The medical student is trained in a tertiary care teaching hospital mainly in an inpatient setting with little or no exposure to early undifferentiated illness, first contact care, delivery of comprehensive, coordinated care with long term continuity and all that entails good quality primary care. At present the undergraduate training in secondary and tertiary care hospitals do not adequately train a doctor with the necessary skills to deliver good quality care at primary level [10,11]. The Sri Lanka Medical Council however still recognizes MBBS with internship covering only two disciplines as adequate to function as an unsupervised General Practitioner[9].

Added to this scenario there is no system to monitor the type of first contact primary care delivered. Inappropriate use of antibiotics leading to microbial resistance, partially controlled NCDs leading to complications, inadequate use of preventive measures at personal and family level, unnecessary use of drugs promoted by pharmaceutical companies are some of the problems that we are faced with. There are also constantly emerging new interventions and treatment schedules which also alter the course of many chronic illnesses which may not be reaching those in General Practice.

We feel that an approach oriented to whole person curative care with provision of coordination of care over a long period of time leading to promotion of health and wellbeing of individuals and families would give good outcomes. There is also a need for introduction of a system where a cohort of people is followed up over long term with accountability for a person's health by a SLMC registered doctor. This needs training of undergraduates

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in required competencies at least at a basic level. This would mean introduction of family medicine teaching which is community based rather than teaching in a hospital based setting[11].

According to the statistics available the state primary care services are delivered by MBBS doctors and registered medical officers in 3 main settings.

1. Primary medical care units - 504
2. Divisional hospitals - 470
3. And outpatient departments of all secondary and tertiary care hospitals - 155[2]

In the private sector, there are the

1. Full time General Practitioners: 500 according to private health services regulatory council (PHSRC)[12] some of whom are members of the College of General Practitioners of Sri Lanka (CGPSL) have had post graduate training.
2. Doctors working for the state but in dual practice who, irrespective of the type of work done for the state, practice as a GP in their off hours and estimated over 7000[2].
3. Doctors employed by the private hospitals; some who have had training in foreign medical schools.

All these doctors need basic skills necessary to deliver primary care as well as continuous updating of knowledge.

Preparation for delivery of quality primary care

At the first level, basic generalist skills could be taught in medical school by specialists in family medicine during the clinical appointments in family medicine. The teachers of family medicine should have continuous dialogue with the colleagues in other clinical departments so that all clinical teachers contribute to teaching of the student in the necessary skills needed for good general practice. The medical school curricula should be drawn up to focus on learning outcomes that deal with problems seen in general practice. The present clinical training where the student is exposed to many minor specialities could be reoriented to teaching /learning of many problems that are brought to a GP. This could be guided by the Departments of Family Medicine. The breadth of general practice could be covered to some extent this way. At Jayawardenepura, we have introduced a log book which lists out the knowledge and skills that they need to gain before they come in for the final year training. The acquisition of skills is tested just prior to the entry into the final year training in family medicine.

Ongoing training

At the second level, skills specific for general practice should be learnt in the natural setting of general practice. If the trainee is attached to the Ministry of Health (MOH), the GP trainee could select to work in a primary care situation under the supervision of specialists in the Departments of Family Medicine or be attached to training centres now manned by the consultants in Family Medicine properly trained and board certified. This would not be a burden on the MOH as the said trainee would man a Primary Medical Care Unit or work in a divisional hospital and carry out assignments in family practice under a supervisors guidance who is not physically near them. This kind of training could be augmented by conduct of workshops at different points in time. The workshops should be organised through the MOH which could easily obtain funding for development of human resources. Moreover, training could be supported by establishing distance education modules. The PGIM could play a major role in type of training to award the Diploma in Family Medicine to a larger number of doctors. It was a team headed by Prof Nandani de Silva who established the first online course for the Diploma in Family Medicine at the Post Graduate Institute of Medicine (PGIM). There are many doctors trained to carry out online education. PGIM should seriously think of re-establishing one.

Another system which could run in parallel, especially for those in private sector or in dual practice is where bite size material will be delivered through an online platform. All GPs in the community could access this learning material, simply via a personal computer at their convenience via a web based user-friendly facade. A set amount of tasks to be completed by the doctor by following short courses of education material that is very importantly based on health goals and up to date practising material. The material needs to be formulated by an independent body of experts liaised with Ministry of Health. Such achievements shall be awarded with credits with certain perks where more they achieve the better it will be. Such time-based accreditation certificates issued by the government upon completion of the courses and displayed in a practice will make sure that the public will also look forward to receiving up-to-date and safe care.

This method of training can be implemented very easily, of course with meticulous care on the curriculum. The technology is available in the country and has nearly 100% penetration throughout the country at very minimal cost to the doctor. Compliance will be high as there is no extra cost of money or time. The practice times will not be interfered and removal of personal factor from the training programme will put a stop to biases and personal opinions from disturbing the programme and inhibit setbacks based on egotism. No leave on duty for training programmes, makes it easier, cost effective and hassle free for the Ministry of Health as well. The computers will do the

corrections for the exams with precision in real time removing the need for a massive very skilled workforce. The system can be easily designed to monitor GP training activity patterns and preference using Artificially Intelligence (AI) which will enable the organizing body to mould the course to increase compliance of the GPs.

As the curriculum is vision oriented in achieving certain health goals, a small pivot in the central system will have a butterfly effect in the community. Of course, a feedback system can be inbuilt, the results will be evident in years to come with reduction in morbidity and mortality patterns and reduced hospital admissions and related costs. Most importantly the quality of life will be much higher in the community especially for the earning population resulting in higher morbidity adjusted life years, more days of work and satisfaction which will have long term positive effect on the economy and international health indices.

The cost of implementation and running will be minimal compared to current expenditure in health but the effect will be incomparably high. Such a project is now being planned by the first author.

The need is to train doctors with competencies and special generalist skills to deal with specific pressing health problems of the country with minimum disturbance to the existing system and at an affordable cost.

The 3rd level will be a higher level which needs to be reoriented to producing an excellent generalist now called a specialist in Family Medicine who could take leadership in training, research and reorganisation of the primary care system.

Those going into full time general practice have the backing of the College of General Practitioners (CGP) with the training and exams conducted for the Diploma for the MCGP, MRCGP(Int) and a mentoring programme by a senior general practitioner[13]. The state should support the College in their endeavours.

The College of GPs is willing to provide expertise to train many doctors in general practice if the Ministry provides the infrastructure. We have now committed members of the CGP and over 30 doctors from the MOH and universities having finalized their MD or waiting to do so in the next few years. These doctors are enthusiastic about family medicine and will work with commitment.

The changing scenarios in morbidly and mortality needs provision of good health care together with universal health coverage for access. There is a need for reorienting the health system as well as strengthening the primary care training programmes if we are to emerge successful in achieving the targets set for Sustainable Developments Goals proposed by the United Nations[10].

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Patient with medically unexplained symptoms in general practice

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Sri Lankan Family Physician, 2017, **33**, 42-45

Introduction

Medically unexplained symptoms (MUS) are common throughout the world and patients from all ages are affected. General practitioners deal with MUS in about 20%-25% of their consultations. Patients present with persistent bodily complaints where adequate examination has not revealed sufficient explanation for structural or other specified pathology and where noorganic cause can be demonstrated. However, to the patient these symptoms are real and can affect patient's ability to function properly. The symptoms are neither faked nor "all in the head".

MUS are common, with a spectrum of severity, and patients are found in all areas of the healthcare system be it primary secondary or tertiary. Patients with a combination of symptoms will often present to primary care or accident and emergency (A&E) departments seeking appropriate treatment. This usually results in a referral to a relevant medical or surgical outpatient department for further investigation. Many of the affected patients do not receive a correct diagnosis and undergo numerous fruitless investigations and attempts at treatment. The cost of dealing with MUS is high to the patient, family and the overall healthcare system.

Life events precipitate MUS, particularly those involving a forced choice between equally undesirable alternatives. But patients with MUS are more likely to attribute their illness to physical causes, rather than lifestyle factors. Not understanding the cause can make them even more distressing to the patient who finds it more difficult to cope with them. A poor or absent relationship with the GP can increase symptom reporting and consultation rates.

The narrow focus on the somatic aspects of a complex problem may reinforce their concerns about having a physical disease, make them less satisfied with the healthcare system, contribute to the development of chronic disablement and cause healthcare costs to become excessive. Also, MUS cause disability as severe as that originating from an organic pathology. And therefore, medically unexplained symptoms represent a clinical problem that must be taken seriously.

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Epidemiology

The risk factors for development of MUS include:

- Female>male
- Young people
- Overprotective parents
- Currently employed
- Stressful life events. e.g. domestic violence, illness or death of a close relative, history of child abuse, work problems, etc.
- Concurrent psychological illness. About 30% of patients with MUS have an underline psychiatric problem, usually anxiety or depression.
- Long term physical illness or trauma.
- Media campaign that highlight specific diseases.

There are two underlying mechanisms that seem to contribute to the development of MUS.

- Enhanced sense of bodily awareness: tendency to notice and amplify normal physical sensations such as heartbeat, peristalsis of bowel, etc. Over awareness increase anxiety and in turn make the bodily sensation appear more likely.
- Misattribution of symptoms: rather than normalizing symptoms wiz 'I have a headache because I have been working too hard', patients with MUS tent to attribute somatic explanations wiz 'I have a headache because I have a brain tumor'.

Some patients are sensitized due to a prior experience of pain or trauma and they misperceive normal bodily sensation due to faulty filtering of normal perceptions. They attend more to their symptoms and develop specific attributions and beliefs about their experiences.

Normal sensation occurs – one of the many visceral or muscular sensations which are normally outside our conscious awareness. An example might be pain from stretching within the gut. The patients perceives this to be something to be worried about and they become vigilant for further feedback from the body that something is wrong. Further normal sensations are perceived and logged as abnormal and the vicious cycle is set up. The patients become concerned that something is wrong and goes to see their GP.

Many patients presenting with MUS also meet the diagnostic criteria for anxiety and/or depression. The likelihood of meeting such criteria increases with the number of unexplained symptoms reported. However, anxiety and depression are also very common in patients with MUS, and again, the likelihood of a person receiving one of these diagnoses increases with the number of symptoms reported. Consequently, on the current evidence, it cannot be inferred that anxiety or depression are causes of medically unexplained physical symptoms. Physical symptoms have been associated with adverse psychosocial and functional outcome across different cultures, irrespective of etiology either explained or unexplained.

The lack of known etiology in MUS cases can lead to conflict between patient and health-care provider over the diagnosis and treatment of MUS. Most physicians will consider that MUS most probably have a psychological cause, even if the patient displays no evidence of psychological problem. Many patients, on the other hand, reject the implication that their problems are "all in their head", and feel their symptoms have a physical cause. Diagnosis of MUS is seldom a satisfactory situation for the patient, and can lead to an adverse doctor-patient relationship. The situation may lead a patient to question the doctor's competence.

Classification

According to patients' complaints, MUS can de classified in to three categories.

- Pain of specific location: headache, back pain, fibromyalgia, etc.
- Functional disturbance in specific organ: palpitation, irritable bowel syndrome (IBS), etc.
- Exhaustion or fatigue: chronic fatigue syndrome, etc.

Many patients have more than one MUS and overlapping of symptoms are common. For an example, patient with IBS often meet diagnostic criteria for chronic pelvic pain and *vice versa*.

Assessment of patient with MUS

A 2008 review in the *British Medical Journal* stated that a doctor must be careful not to tell a patient that nothing is wrong, "as clearly this is not the case". The symptoms that brought the patient to the doctor are real, even when the cause is not known. The doctor should try to explain the symptoms, avoid blaming the patient for them, and work with the patient to develop a symptom management plan.

Assessment of patients with MUS is challenging, time consuming and very difficult. Consider a diagnosis of MUS in any patient with physical symptoms more than 3 months that affecting functioning, but cannot be readily explained. Even, if the patient is known to present with MUS, perform the assessment without prejudice. Patients with MUS have the same chance of developing serious new illnesses as any other patients. Therefore, ask:

- What are the symptoms and how long? To rule out 'red fags'.
- What type and how much of impairment do the symptoms cause?
- What are the patient's belief or concerns about the symptoms?
- What are the patient's current idea, knowledge and understand about the symptoms?
- Has the patient sought information from other sources? Internet, friends.
- What made the patient come to meet the doctor today?
- What are his expectations of meeting a doctor today or what would the patient like doctor to do for him/her?
- Are there any signs of a disease on physical examination?
- Does the patient has any signs of low mood or any symptoms of anxiety? If so assess for depression/anxiety using screening questionnaires.
- Are there any other social or psychological factors that may be triggering symptoms?

To get a proper understanding of the symptoms of the patients, sometime doctor may need to do certain relevant investigations. Investigation causes significant iatrogenic harm but only 4-10% go on to have an organic cause.

Therefore, more importantly review patients past history and available records/reports carefully before ordering an investigation. Usually investigations are used to clarify diagnosis and reassure the patient and the doctor. It is important to find a balance between appropriate investigation and risk of harm through over investigation. Prior to doing investigations, explain why they are being done and meaning of positive or negative results.

However, in patients with MUS:

- 50% of patients are not reassured following negative investigations.
- False positive results lead to increased anxiety and further investigations.
- Some investigations may increase the patient's illness behavior.

Management of patients with MUS

Managing of patients with MUS is challenging even to a very experienced doctor. The whole primary care health team should be aware of the diagnosis and management plan. This will make the approach to management consistent across the practice.

Try to offer specific treatment options, if self-help is ineffective. When managing this type of patients, four key areas should be considered.

- Connecting: go back to the beginning, listen to the patient, acknowledge and validate the patient's sense of suffering – empathy; acknowledge it can be frightening. watch for signs, use existing knowledge of the patient as individual.
- Summarizing: allow the patient to summarize the problems, recap the understanding of the problem to the patient, give explanations to patients without medical jargons; use the patient''s language to offer tangible explanations of what is causing the symptoms; be clear on what is not wrong and why show doctor's interest in the patient's problem.
- Handover: develop a shared action plan or personal health plan involving patient with realistic goals to improve functioning, agree that the goal is to restore function, as well as minimizing symptoms. Believe in patients and their ability to manage this; encourage them; build on their strengths.provide reassurance on long term outcome.
- Safety netting: understand positive risk management and discuss that with the patient; share the uncertainty. Reassure the patient that they will always be taken seriously and any working hypothesis will be reassessed. Inform patients about red flags indicating serious disease, offer follow ups if symptoms changed or any other concern occurred.

Regular appointments may be helpful as may a brief physical examination at each visit to check for sign of a disease. Avoid referral, unless there is a clear medical indication.

Medical care of MUS should include improvements in three interrelated elements: diagnosis, specific treatment strategies and communication. The professional needs to consider multiple modalities and approaches, and personalize the plan with physical, medical, pharmacological, psychological (CBT; PDT), social and spiritual.

- Offer suggestions for self-management, such doing voluntary works. Encourage patient to work, if possible. Increasing physical activity levels may be useful. Regular physical exercise seems to be of benefit.
- Antidepressant medication – Amitriptyline 10 mg at 5 pm. As response is often not dose dependent, start with a low dose, explain that drug is not being used to treat depression. SSRI antidepressants have highly unpredictable effects in MUS.
- Consider low doses of Pregabalin (50mg bd) where GAD is a feature. Promotes sleep, reduces anxiety, reduces rumination – licensed for GAD. Buspirone can be helpful too.
- Cognitive behavioural therapy (CBT) – allow patient to develop changes in thinking or behaviour that will help them cope more effectively with their problems. Behavioural activation is just a focused way to schedule activities day by day. It can be offered as part of a CBT package.
- Manage specific MUS accordingly.
    - o Fibromyalgia.
    - o Irritable Bowel Syndrome (IBS).
    - o Chronic pelvic pain.
    - o Chronic fatigue.
    - o Atypical facial pain.
    - o Nonspecific chest pain.
    - o Somatization disorders. Etc.

Consider a psychiatric assessment where no cause has been found and advice is needed about medication. Refer early for psychological therapy if the underlying cause is thought to be psychological. Treating an associated psychological problem can often relieve the physical symptoms.

Prognosis

4-10% of patients with MUS go on to have an alternative organic explanation. Of those with true MUS, 25% will have ongoing symptoms after 12 months. 75% remain unexplained at 12 months. 30% (10% - 80%) have an associated psychiatric disorder (usually depression, anxiety) depending on how many unexplained symptoms are present.

Appropriate services for people with MUS should be commissioned in primary care, community, day services, A & E departments and inpatient facilities. This would enable patients to access services that are appropriate for the severity and complexity of their problems. In addition to a range of MUS services, a new kind of multidisciplinary approach is required, bringing together professionals with skills in general practice, medicine, nursing, psychology/ psychotherapy, psychiatry, occupational therapy and physiotherapy. All healthcare professionals should integrate both physical and mental health approaches in their care. Education and training are essential to ensure

that all healthcare professionals develop and maintain the skills to work effectively with patients experiencing MUS. Implementation of appropriate service would result in improved outcomes for patients and substantial cost-savings for the healthcare system.

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Dealing with vitamin D deficiency in general practice – A Review

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Sri Lankan Family Physician, 2017, **33**, 46-49

Abstract

Vitamin D is the most common nutritional deficiency worldwide. It is characterized by serum 25 (OH) D< 50 nmol/L. It is usually caused by sun avoidance, using sun protection, inadequate dietary intake, malabsorption syndrome and some drug interaction. Most of the patients are asymptomatic or present with nonspecific symptoms, however severe and prolong deficiency causes rickets or growth retardation in children and osteomalacia, osteopenia or osteoporosis in adults. Vitamin D deficiencies are treated with supplementary vitamin D and sensible sunlight exposure after plasma assays.

Introduction

Vitamin D deficiency has been recognized as a worldwide health issue and common under diagnosed condition. It presents with a wide range of acute and chronic medical conditions. Several studies suggest that vitamin D reduces the risk of type 1 diabetes mellitus, certain cancers, cardiovascular disease, depression, cognitive decline, autoimmunity, pregnancy complications, allergy and frailty[1,2].

Epidemiology

It is the most common worldwide nutritional deficiency[3,4]. It is associated with various medical conditions and the strong associations are summarized in table 1.

Metabolism of vitamin D

There are two forms of vitamin D. Ergocalciferol (D2) is a plant product and cholecalciferol (D3) is an animal product1. Vitamin D is a fat-soluble vitamin and a hormone. Vitamin D3 is produced endogenously. Both vitamin D2 and vitamin D3 can be obtained from food (Figure 1).

As sunlight destroys any excess vitamin D3 produced in the skin, excessive sun exposure cannot cause vitamin D3 intoxication. Major active form of vitamin D is 1,25 (OH)D (calcitriol)[5,6,7,8].

Table 1. Medical conditions, which are strongly associated with vitamin D deficiency

Cancers	Prostate, Colon, Breast Ovarian, Pancreas
Cardiovascular system	Hypertension Heart diseases
Pregnancy	Pre-eclampsia, Low birth weight Preterm birth
Infections	Tuberculosis URTI Upper respiratory tract infection
Neuro-psychiatry	Schizophrenia, Parkinson's disease' Cognitive dysfunction, Alzheimer's diseases, Dementia, Depression
Autoimmune disease	Type1 diabetes mellitus
Rheumatology	Osteoarthritis

Vitamin D deficiency/ insufficiency

Vitamin D deficiency is defined as a serum 25 - hydroxy vitamin D level of <50 nmol/L (<20 ng/ml) and vitamin D insufficiency is defined when the 25 hydroxy vitamin D level falls between 52 and 72 nmol/L (21 and 29 ng/ml)[3,4,9,10].

Causes of vitamin D deficiency and insufficiency

Sunlight is the major source for vitamin D. Table 2 illustrates the common etiology for vitamin D deficiency or insufficiency. Ability of the skin to produce the vitamin D decreased with age. Therefore aging is considered as a risk factor[11].

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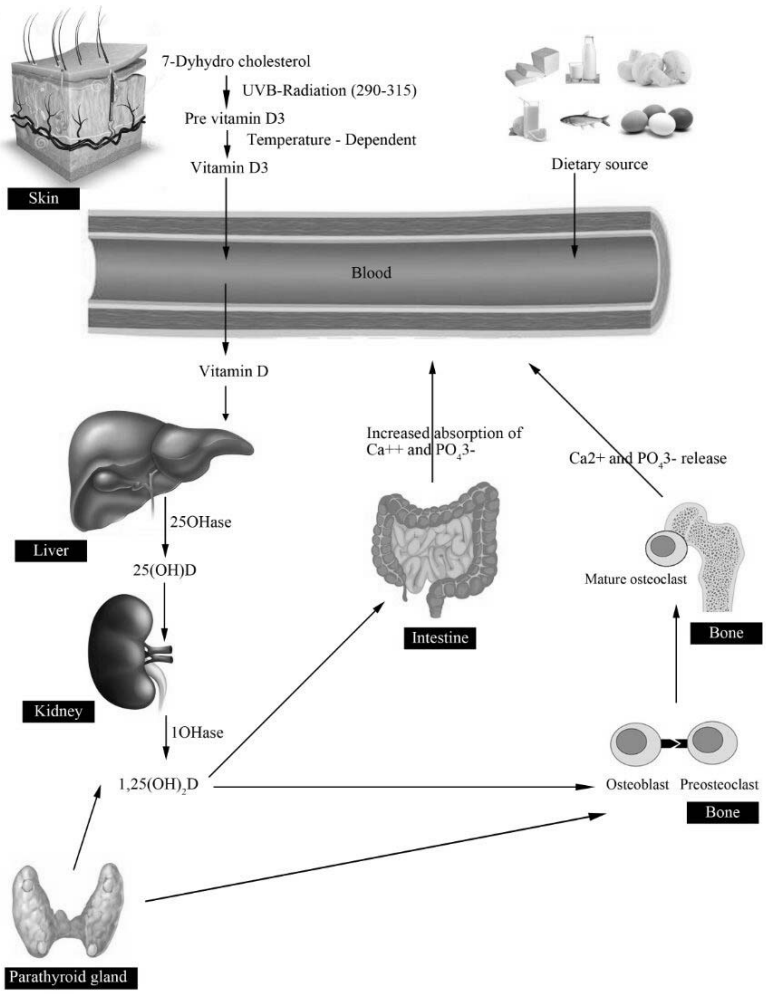

Figure 1. *The metabolism of vitamin D in human body.*

Table 2.

Acquired

- Lack of sun exposure.
- Application of sun block creams.
- Inadequate dietary and supplemental vitamin D.
- Intestinal malabsorption (celiac diseases, crohn's disease).
- Renal failure.
- Severe liver failure.
- Drugs (antiepileptic, glucocorticoids, Rifampicin,
- Primary hyperparathyroidism.
- Hypothyroidism.
- Obesity.

Inheritance

- Vitamin D- Dependent rickets (Type 1, Type 2, Type 3)
- X-linked hypophosphatemic rickets
- Autosomal – dominant hypophosphatemic rickets.

Table 3. Symptoms of vitamin D deficiency

Adults	• Bone pain (localized/generalized)
	• Easy fatigability
	• Malaise
	• Difficulty in rising from a sitting position
	• Muscle cramps
	• Parasthesia
Children	• Failure to thrive
	• Delayed achievement of motor milestones

History and clinical examination

History and clinical examination are essential for the diagnosis and screening. In mild or early disease, patient can be asymptomatic[12,13,14,15].

Table 4. Signs of vitamin D deficiency in children and adults

In children (rickets)

- Bone deformity of forearm
- Posterior bowing of distal tibia
- Genu varus
- Valgus deformity of legs
- Rachitic rosary
- Frontal bossing
- Pectuscarinatum
- Head sweating

In adults

- Bone tenderness
- Waddling gait
- Proximal myopathy

Laboratory investigation

Serum level of 25 (OH) D is the best method to determine. Although 1,25 (OH) 2D is the biologically active form, it provides no information about vitamin D status, because it is often normal or even elevated in children and adults who have vitamin D deficiency, 1000 times lower than 25-(OH) D and has a low half-life -4 hours.

Measurement of plasma calcium, phosphate, intact PTH and alkaline phosphatase can help to determine the etiology for vitamin D deficiency.

Table 5. Typical biochemical profile of vitamin D deficiency

Biochemical profile	*Results*
Serum 25 (OH) D_2	Low
Serum Ca^{2}+	Normal
Phosphate	Low-normal
Intact PTH	High-normal/ elevated

Table 6. Expected radiological finding of patients with rickets, osteomalacia and osteoporosis

Rickets	Widening of epiphyseal plate
Osteomalacia	Looser's pseudo fracture
Dual X-ray absorptiometry	Osteoporosis, osteopenia

Diagnostic criteria

Vitamin D deficiency

It is defined as serum 25-hydroxyvitamin D level of <50 nmol/L (<20 ng/ml).

Vitamin D insufficiency

It is defined as serum 25-hydroxyvitamin D level between 52-72nmol/L (21-29ng/ml).

In children, a serum 25- (OH)D level of <37nmol/L in usually associated with skeletal manifestation of vitamin D deficiency rickets[1,2].

Management

Vitamin D replacement

Vitamin D replacement is the mainstay of treatment. Target level of vitamin D in both children and adults is serum 25(OH)D3 between 75 and 250 nmol/L. The correction can be with vitamin D2 (ergocalciferol) or vitamin D3 (colecalciferol). Both can be given orally for 6 to 8 weeks followed by a lower maintenance dose. Ongoing maintenance therapy is recommended for those with documented vitamin D deficiency and where the underlying cause for this cannot be rectified.

Higher daily oral dose is required in patient with intestinal or fat malabsorption syndromes and history of gastric bypass surgery. Pregnant or lactating women with vitamin D deficiency should be treated as for non pregnant adults[3].

Insufficiency

Ergocalciferol/Colecalciferol

Children are treated with a dose of 1000-2000 IU/day for 8weeks or 50,000 IU given orally once weekly for 6 weeks followed by a maintenance dose of 400 – 1000 IU/ day . For an adult, 50000 IU is given orally once weekly for 8 weeks followed by a maintenance dose of 50000 IU twice monthly[16,17].

Deficiency

Ergocalciferol

In children – It is treated with 1000-2000 IU/day or 50 000 IU orally once weekly for 6 weeks and then followed by a maintenance dose of 400-1000IU/day. Adult are treated with 50 000IU orally once weekly for 8 weeks and then followed by 50 000 IU twice monthly as maintenance[16,17,18,19].

Colecalciferol

Children are treated with 1000-2000IU/day orally for 8 weeks or 50 000IU orally once weekly for 6 weeks. Maintenance dose is 400-1000IU/day. Adults are treated with 50 000 IU orally once weekly for 8 weeks and 50 000 IU is given twice monthly as maintenance[16,17,18,19].

UVB radiation exposure

UVB radiation exposure is an excellent source of vitamin D and it should be recommended to all patients for both treatment and prevention.

Exposing the arm and legs (with sun protection of the face) for about 5 to 30 minutes between 10 am and 3 pm twice a week is recommended. Darker skinned people require longer exposure (3-6 times)[20].

Calcium and phosphate replacement

Patients who do not meet the daily requirements of calcium from dietary source alone should be given supplementation. Recommended dietary intake of calcium is between 1000-1300 mg/day depending on age and sex.

For children, calcium carbonate is given 45-65 mg/kg/day orally in 4 divided doses. Adults are given 1-2g/day orally in 3-4 divided doses for both vitamin D deficiency and insufficiency. Supplementation of phosphate is not orally needed unless there is acquired or inherited disorder-causing phosphate wasting in the kidney[21].

Conclusion

Vitamin D deficiency should be considered as a differential diagnosis for patients presented with non specific symptoms. However diagnosis of vitamin D deficiency is only possible by assessing the plasma Vitamin D level. Unfortunately high cost of plasma vitamin D assays is a big challenge. There is no enough evidence to prescribe vitamin D and then periodic monitoring of any symptomatic improvement without plasma assays.

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Dealing with medically unexplained symptoms in primary care

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Sri Lankan Family Physician, 2017, **33**, 50-53

Introduction

Case history

A 60 year old lady presented to a general practitioner with a history of upper abdominal discomfort and indigestion for several years. She had already consulted many doctors including a general physician, gastro-enterologist and surgeon. She had undergone an upper gastrointestinal endoscopy two months ago, which had been normal. Despite her good compliance with medical treatment and undergoing an array of expensive investigations, she had not been able to get rid of her symptoms. As a result the patient started to think that her condition could be due to a serious illness that could not be diagnosed by doctors. At the same time her symptoms were further aggravated by a statement by her daughter in law; "Better to consult a psychiatrist you may be having a mental problem..."

There are many scenarios like this. How can we as general practitioners deal with this type of clinical scenario? – Medically Unexplained Conditions.

Medically Unexplained Symptoms (MUS) are defined as; incompatibility of the clinical presentation with a known physical illness and/or absence of relevant positive physical signs and/or laboratory investigations not supporting a diagnosis of a physical illness[1].

MUS account for a significant proportion of morbidity and utilisation of health care services.[2,3] It is reported that around one third of physical symptoms presenting to primary care settings are MUS.[4] In a meta-analysis of medically unexplained symptoms in primary care, the percentage of patients complaining of at least one medically unexplained symptom ranged from 40.2 to 49%[5].

Patients with MUS often have significant functional impairment with loss of productivity, decreased quality of life, social isolation and increased expenses for investigations and management[6-10].

Management of a patient with MUS can take a lot of the doctors'time. Most of the encounters create disagreement between doctor and patient. A qualitative study among doctors found that there was considerable anxiety regarding the management of MUS particularly around concerns of missing serious pathology[2, 11].

There is also little consistency of approach to MUS; few doctors reported that they had a formal training in this area, any such training were mainly in lecture mode and not very practically oriented[2]. Therefore it is obvious that the management of MUS is an important challenge.

Objectives

This review was prepared with a view to provide evidence based information to overcome the above challenges. It will provide a better understanding about MUS and help inclinical decision making in managing MUS.

Methods

A literature search was conducted using the PubMed database and Google scholar using the search items medically unexplained symptoms, risk factors, management. Studies were only included if they were in English. Two investigators made separate reviews which were combined as one narrative review after many discussions.

Discussion

The findings are summarised under four headings: understanding MUS, clinical evaluation, management and prognosis of MUS.

Understanding MUS

Numerous studies have postulated that cognitive and behavioural responses contribute significantly to the origin of MUS. These include illness worrying, symptom catastrophising, and pain avoidance behavior[12, 13].

The common sense model describes how an individual constructs an internal representation of what is happening when they experience physical or psychological symptoms. This model explains how a person faced with an illness forms a representation of the

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threat to health using lay knowledge and input from others. Illness representations are based around dimensions such as perceived cause of the illness, consequences of the illness, "label" given to the illness and the symptoms associated with it, expected timeline of the illness, controllability of the illness, emotional response to the illness etc[14].

According to the Oxford hand book of general practice, MUS can be classified into three broad categories: pain of a specific location, functional disturbance in a particular organ and chronic fatigue/ exhaustion.[15] MUS have a significant association with comorbid psychiatric illness.[16] Attempts to define MUS using psychiatric labels have however met with limitations and MUS go beyond the definition of psychiatric diagnoses[17].

Clinical assessment

A comprehensive assessment should be carried out considering socio-cultural and family dynamics, illness behaviour and individual personality. Early diagnosis of MUS is only possible with thorough symptom evaluation, excluding common disease conditions, serious disease conditions as differential diagnoses and considering patient fears, concerns and expectations. It has been written that a comprehensive assessment in itself can be therapeutic[18].

Even after diagnosis, continuous evaluation and follow up is mandatory. These patients have the same or even higher risk for developing any serious illness compared to the general public[19].

Management

Mutual understanding and trust among the doctor and patient is fundamental for effective management. It will only be possible through active listening, effective communication and shared decision making between the doctor and patient. Safety netting on each occasion would be important. Regular appointments with motivation of patients for self-care will yield better outcomes[19].

Previous studies recognise the importance of a patient centered approach. Illness beliefs held by patients influence their decision to initiate a consultation as well as the persistence of symptoms and the degree of disability[1]. Doctors recognise the importance of providing reassurance, explanation and psychological support[2,9,17,19,20]. A trusting doctor patient relationship and making sure that patients feel that their concerns are heard are important requisites in management[2]. During the consultation doctors should take patient problems seriously, and involve patients actively in treatment decisions[21]. Time pressures, lack of continuity of care and limited management options can be considered as challenges to the careful management of MUS[19].

There are some specific management modalities for some common medically unexplained symptoms such as fibromyalgia, IBS, chronic fatigue syndrome, and chronic pelvic pain. Cognitive behavioral therapies and counseling programs are evidence based management modalities. Low doses of antidepressants can be administered accompanied with the clear explanation to the patient that they have not been diagnosed with depression[19].

It is recommended and evidence proven that motivating patients to continue their day to day activities will help them to overcome the illness earlier[22,23].

There is consensus that repeated referral and investigation is not helpful, is likely to be costly and may lead to worse outcomes. Clinicians need to balance this decision against the risks of not detecting a disorder[2,24]. It has been proposed that clinicians should promote the appropriate use of 'restraint' with investigations and consider all their potential consequences, including iatrogenic harm. One author argues that, senior clinicians are well placed to do this and to demonstrate the appropriate use of restraint to juniors[2].

Chalder and Willis have presented a transdiagnostic approach that considers the overlap between syndromes and the instability of diagnoses within individuals. Unified treatment protocols focus on identifying and targeting cognitive and behavioural responses to symptoms that are common across MUS conditions[12].

In a qualitative study exploring GP management, GPs used three major strategies while searching for a diagnosis. The methods and their pros and cons can be summarised as follows.

1. Adopting a purely biomedical approach, going by the routine method. This is led by practical constraints. When dealing with MUS the GP should be aware of non physical or psychosocial factors as a cause for MUS.

2. Watchful waiting, normalising of symptoms and avoiding placing the patient in a sick role. It may be better approach for MUS. However effective safety netting and regular follow up is necessary for its' success.

3. Physical diagnosis is ruled out and the doctor will consider alternative explanations. They are open to more complex explanations and patient education methodologies, emphasising the normal reactions to distress and explanation that not everything has a biomedical explanation[25].

Prognosis

In a prospective cohort study over five years among patients with MUS more than half of patients presenting with a physical symptom had symptom resolution by 5 years, while a third remained medically unexplained[26]. A proposed qualitative prognostic classification of symptoms is based on "multiple symptoms, multiple systems and multiple times". According to this classification MUS are classified into three categories: self-limiting symptoms, recurrent or persistent symptoms and symptom disorder. Although self-limiting symptoms are common, their good prognosis means that they can be managed within a conventional consultation context. Symptom disorder affects relatively few patients; most of these patients meet the criteria for psychiatric classification disorders, such as somatic symptom disorder, of at least moderate severity, and they may benefit from specialist or multidisciplinary treatment. It is mainly the recurrent and persistent symptoms that must be managed with special care in a family practice[27].

Conclusion

The high prevalence and significant burden of MUS highlights the need for adopting efficient management modalities in all health sectors especially in general practice. Evidence shows that there are a variety of efficient management modalities in this regards: use of explanatory models, addressing the patients' ideas concerns and expectations and maximal engagement of the patient in the management. It is obvious that these management modalities are only possible if doctors adopt continuity of care, safety netting, comprehensive patient assessment, communicate effectively, spend adequate time with patients and consider the "patient as a person". Continuity of care is a basic principle of family medicine. It is the foundation on which a strong trusting doctor patient relationship is built. Without trust, management of MUS would be difficult. Furthermore continuity of care helps the doctor to have a background knowledge about the patient even before any problems start which in turn help the comprehensive assessment. Effective communication skills not only help the GP to advocate for the patient but arrange appropriate referral.

Basic training in family medicine equips a doctor with many of the evidence based skills necessary to manage MUS. Family medicine emphasises the need for personalised and patient centred management that is a corner stone of managing MUS. Dealing with uncertainty in the management of undifferentiated symptoms is also emphasised in family medicine training. It is well accepted that referral and investigation should be undertaken with great caution to avoid labeling the patients and reinforcing the sick role.

In managing MUS adopting the principles of family medicine will give better outcomes. The GP can be considered as the focal point in managing MUS or even a specialist for MUS.

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From the Dhammapada

Sri Lankan Family Physician, 2017, **33**, 54

Chapter 1

Verse 13. Lust Penetrates Untrained Mind

Even as the rain does penetrate
a house that's badly thatched,
likewise lust does penetrate
the mind uncultivated.

Verse 16. Good Deeds Bring Happiness

Here one joys, one joys hereafter,
in both ways does the merit-maker joy;
one joys and one rejoices,
one's own pure kammas seeing.

Verse 5. Hatred is Overcome Only by Non-hatred

Never here by enmity
are those with enmity allayed,
they are allayed by amity,
this is the timeless Truth.

Chapter 2

Verse 26. Treasured Mindfulness

Foolish folk of little wit
in heedlessness indulge,
the one who's wise guards heedfulness
kin to the greatest wealth.

Chapter 3

Verse 34. The Fluttering Mind

As fish from watery home
is drawn and cast upon the land,
even so flounders this mind
while Mara's Realm abandoning.

Chapter 4

Verse 47. Pleasure Seeker is Swept Away

For one who has a clinging mind
and gathers only pleasure-flowers,
Death does seize and carry away
as great flood a sleeping village.

Verse 50. Look Inwards and Not at Others

Not others' opposition
nor what they did or failed to do,
but in oneself should be sought
things done, things left undone.

Verse 52. Good Words Profit Only Those Who Practise

Just as a gorgeous blossom
brilliant and sweet-scented,
so fruitful the well-spoken words
of one who acts as well.

Verse 54. Fragrance of Virtue Spreads Everywhere

The fragrance of flowers drifts with the wind
as sandalwood, jasmine of lavender.
The fragrance of virtue o'er sweeps the wind,
all pervasive is virtue of the good.

*(Sent by **Prof Antoinette Perera**)*

From Bhagavad Gita

Kandasamy Arulanandem[1]

Sri Lankan Family Physician, 2017, **33**, 55

Hinduism is the oldest religion in the planet and vastly diverse in its beliefs, practices and ways of worship. It has no beginning and has no human founder but it precedes recorded history. It is very much difficult to encompass all the beliefs of Hinduism in one or two pages. But, The *Bhagavad Gita* is a unique book for all ages. It is one of the most authoritative books of the Hindu religion. It expounds very lucidly the cardinal principles or the fundamentals of the Hindu religion and Hindu Dharma.

The Hindu dharma is a diverse system which says that man must purify his heart, experience the "Ultimate Reality" and be free. Freedom from all imperfections is the goal of human life Hindus believe many diverse things, but there are a few bedrock concepts and share a vast heritage of culture and belief karma, dharma, reincarnation. In Hinduism Dharma means 'duty', 'virtue', 'morality', even 'religion' and it refers to the power which upholds the universe and society

The *Bhagavad Gita* is a message addressed to each and every human individual to help him or her to solve the vexing problem of overcoming the present and progressing towards a bright future. The world is one huge battlefield. Each discourse holds for you an invaluable new lesson and imparts a new understanding of yourself in a marvellous way.

Dharma is the power that maintains society, it makes us moral people or rather gives humans the opportunity to act virtuously. But acting virtuously does not mean precisely the same for everyone; different people have different obligations and duties according to their age, gender, and social position. Dharma is universal but it is also particular and operates within concrete circumstances. The law of Karma is the law of cause and effect. It is the divine law of justice by which an individual creates his own destiny through thought, word and deed.

Based on Harmony in the *Gita* Man is a composite of three fundamental factors, namely, will, feeling and cognition. There are three kinds of temperament – the active, the emotional and the rational. Even so, there are three Yogas – Jnana Yoga for a person of enquiry and rational temperament, Bhakti Yoga for the emotional temperament, and Karma Yoga for a person of action. One Yoga is as efficacious as the other.

According to *Gita* "Real life is life in the eternal Soul. True life is identification with this Supreme Soul, which exists in the past, present and future, which has neither a beginning, middle nor end, which has neither parts nor limbs, which is neither subtle nor gross".

"In the *Gita*, III.33, it is said, 'Even a wise man acts in accordance with his own nature; beings follow their nature; what can restraint do?' What then is the use of our attempt at controlling the senses and the mind when our nature is so powerful and overwhelming? How can our Sadhana overcome it?"

"Noble indeed are all these; but I deem the wise man as My very Self; for, steadfast in mind, he is established in Me alone as the supreme goal" – VII.18.

The *Gita* again and again emphasises that one should cultivate an attitude of non-attachment or detachment. It urges repeatedly that an individual should live in the world like water on a lotus leaf. "He who does actions, offering them to Brahman and abandoning attachment, is not tainted by sin as a lotus leaf by water" – V.10.

He who has no attachments can really love others, for his love is pure and divine. "Therefore, without attachment do thou always perform action which should be done; for, by performing action without attachment man reaches the Supreme" – III.19.

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From the Holy Bible ……

Sri Lankan Family Physician, 2017, **33**, 56

It takes little yeast to make the whole lump of dough rise. **Chapter 5:** *Galathians*

The law is summed up in one commandment, love your neighbor as you love yourself. **Chapter 5:** *Galathians*

Love is patient and kind; and envies no one; love is not conceited or proud. **Chapter 13:** *Corinthians*

Help to carry one another's burdens and in this way you will obey the law of Christ.

Everyone has to carry his own load.

Do not deceive yourself; No one makes a fool of God: person reaps exactly what he sows.

Let us not get tired of doing good. If we do not give up the time will come when we will reap the harvest. **Chapter 6:** *Galathians*

The wind blows where it wishes; you hear the sound it makes, but cannot tell where it comes from and where it is going, it is like that with everyone who is born of the spirit. **Chapter 3:** *Gospel according to St. John*

*(Sent by **Prof Antoinette Perera**)*

From the Holy Quran

Sri Lankan Family Physician, 2017, **33**, 57

1. Is there any reward for good other than good? **Quran** 55:60

2. And incline not toward those who do wrong, lest the Fire should touch you, and you have no protectors other than Allah, nor you would then be helped. **Quran** 11:113

3. And seek help through patience and prayer, and indeed, it is difficult except for the humbly submissive [to Allah]. **Quran** 2:45

4. And We will surely test you with something of fear and hunger and a loss of wealth and lives and fruits, but give good tidings to the patient. **Quran** 2:155

5. So give to the kinsman his due, and to the needy, and to the wayfarer. That is best for those who seek the favour of Allah, and it is they who will prosper. (Chapter 30: 39)

6. Verily, Allah is with those who are righteous and those who do good. (Chapter 16: 126-129)

7. Whoso acts righteously, whether male or female, and is a believer, We will surely grant him a pure life; and We will surely bestow on such their reward according to the best of their works. (Chapter 16: 98)

8. Allah burdens not any soul beyond its capacity. (Chapter 2: 287)

*(Sent by **Prof Antoinette Perera**)*

Drug resistant hypertension

P J K M S Rupasinghe[1], **S Samaranayake**[2], **M S A Perera**[3]

Sri Lankan Family Physician, 2017, **33**, 58-61

Chitra (not her real name) is a pleasant, soft spoken lady of 63 years of age. She consulted us about 8 months ago with poorly controlled hypertension. Her history of hypertension goes back to 20 years and she was treated by a General Practitioner close to her house. Initially and for many years she had been well controlled according to recorded information. Over the last one or two years, drugs had been added but with poor results. She was on Olmisartan 40 od, Felodipine 10 mg, and Atenolol 100mg mane and also on HCT 25 mg mane. She consulted us with this drug regime as she needed a prescription to purchase these drugs, on the advice of her husband and daughters who were our patients for a long time. She was on Atorvastatin 20 mg daily for her dyslipidaemia. During follow up in the Family Practice Centre, drug doses were changed frequently due to poor control of her blood pressure. Cheaper drugs which were substituted in place of Olmisartan and Felodipine did not work. With the present drug regime still her blood pressure was 170/100mm Hg. Her drug compliance was good. She used to do regular exercise and she used low salt diet. There were some ongoing family problems which may have added to the poor control and she was counselled as well.

She had no history of excessive day time sleepiness or snoring. She had no episodic palpitations, headaches and diaphoresis. She had undergone hysterectomy 15 year back due to menorrhagia as a result of fibroids and she was never given Hormone Replacement Therapy. She was not on any other long-term drugs.

She was a housewife and husband was a retired mechanic. She had 2 daughters and she lived with her husband and unmarried daughter.

On examination BMI was 28. Her BP was 160/80mmHg. She had no cardiomegaly. Her lung bases were clear. She had no hypertensive retinopathy. She had no renal bruit. She had no ankle oedema.

Her investigations were as follows.

Total cholesterol – 173 Triglycerides 81 HDL 34 LDL 122.8 VLDL 16.2

Total cholesterol/ HDL 5.0

FBS – 98 mg/dl

UFR – Protein – normal, No red blood cells

BU – 20.5 mg/dl (17 - 49) Blood urea nitrogen – 9.6 mg /dl (8-23)

Serum creatinine – 0.68 mg/dl (0.7 - 1.3) eGFR - 87.4 ml/min/1.73m^2 (45 - 104)

ALT – 38.3 u/L (0 - 40)

Serum sodium 144.4 mmol/L, Serum potassium – 4 mmol/L, Serum chloride – 100 mmol/L

US scan abdomen was normal except for fatty liver grade 1.

She was referred to a specialist physician because of her drug resistant hypertension (RH) and he changed the drug regime to Prazocin 4 mg bid, Hydrochlrothiazide 25 mg mane, Losartan potassium 50 mg bid and suggested to add amlodipine in the event of poor control. She returned to us seeking advice on this new regime. We reassured her and warned her of what to do if side effects occur, and got her to start on Prazoin 3 mg bid to start with and also the other drugs. Her blood pressure with this regime is now 130/80 mm Hg and we are in the process of monitoring her.

Hypertension – a very common reason for encounter in General Practice

Hypertension is the most prevalent cardiovascular disorder, affecting 20-50% of the adult population in the world. The prevalence of hypertension increases with age, rising rapidly after the age of 50 years and affecting more than 50%[1].

Elevated BP has been identified as a risk factor for coronary heart disease, heart failure, stroke, peripheral arterial disease, renal failure and atrial fibrillation in both men and women[2].

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Hypertension is poorly controlled worldwide, with less than 25% controlled in the developing countries and less than 10% in developed countries[1].

RH is defined as BP which is resistant to treatment when a treatment strategy that include adequate lifestyle measures plus a diuretic and 2 other antihypertensive drugs belonging to different classes at sufficient doses fails to lower SBP and DBP values to less than 140 and 90 mmHg respectively[3]. Patients whose BP is controlled with 4 or more drugs are also considered to have RH. Chitra was considered to have RH as she had uncontrolled hypertension in spite of treating with varying regimens of drugs which included diuretics in addition to life style measures.

Prevalence of RH depends on the population examined and the level of medical screening and it is estimated that 5% to 30% of overall population has RH[4]. A study done in Cardiology Unit of Sri Lanka to assess the prevalence of resistant hypertension revealed that a significant proportion was having uncontrolled hypertension and nearly 1/5th of the population was suffering from RH which was significantly associated with comorbid obesity and diabetes mellitus[5]. In primary care setting RH can be expected to encounter one in every 20 hypertensive patients[6].

The true prevalence of RH is difficult to measure because many patients really have "pseudo-resistant" hypertension which refers to poorly controlled BP which appears resistant but really is due to other factors. The commonest causes for apparent treatment resistance are non-adherence to medication and inadequate drug treatment. Other associated factors include poor adherence to lifestyle advice, poor BP measurement technique, white-coat hypertension and the use of other drugs that interfere with BP[7]. Chitra was treated with various drug regimens in adequate doses and her lifestyle measures were satisfactory and there were no other drugs interfering used concomitantly and BP measuring techniques were satisfactory. In this instance there was no evidence of secondary cause for her poorly controlled BP and so most probably she has RH.

In most instances the pathogenesis of RH is not clear. Only in few instances the cause is secondary hypertension. If it is not secondary hypertension the condition is most likely multifactorial. Aberrant sympathetic nervous system activation and altered renal sodium and water handling due to changes in the renin-angiotensin-aldosterone system include the proposed mechanisms for RH[6].

Assessment for secondary aetiology includes detailed history and physical examination looking for any evidence pointing towards an underlying diagnosis. For instance, should look for symptoms of obstructive sleep apnoea, episodes of palpitations with headache and diaphoresis which might suggest pheochromocytoma or an abdominal bruit which could suggest renal artery stenosis[8]. However in most instances the clinical assessment is unremarkable.

Comprehensive assessment of Chitra revealed no evidence of secondary cause and most probably multiple factors might be contributing to her RH.

At minimum, all the patients should undergo a serum creatinine level, estimated glomerular filtration rate and urine full report due to the high prevalence of chronic kidney disease[7]. If there are any abnormalities in these tests a renal ultrasound scan and serum electrolytes should be done. Further screening test for other secondary causes are not mandatory and should be selected according to the clinical situation[7]. All the investigations of Chitra were normal. Ideally 24-hour ambulatory blood pressure monitoring also should have been done to exclude white-coat effect. The ambulatory readings correlate with morbidity and mortality than clinic readings[9].

All the patients with RH should be assessed routinely for any signs of end organ damage which may include annual eye screening, ECG and a urine full report.

Management should include both lifestyle modification and drug treatment. Blood pressure target in a patient without complications should be 140/90 mmHg which could be eased to 150/90 mmHg in patients greater than 60 years of age and in patients with target organ damage more suitable target is 130/80 mmHg[10].

Non-pharmacologic strategies are vital in management of hypertension of any severity and it complements the efficacy of drug therapy. These measures include smoking cessation, reduction in alcohol intake, dietary sodium restriction, healthy dietary plans, increased physical activity and weight loss[11].

Mainly drug regimens used in RH are empirical as there are less randomized controlled trials to guide the best treatment choice. Initial drugs of choice are as same as for essential hypertension and best method is to use combination therapy considering different physiological mechanisms and the comorbidities of the patient[12].

According to the guidelines of the National Institute for Health and clinical excellence (NICE), treatment should be initiated with angiotensin-converting enzyme inhibitor (ACE inhibitor) in patients <55 years of age, or dihydropiridine calcium channel blocker (CCB) in patients >55 years and black patients of any age. These 2 drugs then can be combined and doses should be optimized before adding a thiazide as a third drug. This triple therapy must be optimized before any other add on therapy as this combination will most of the instances will control the BP[11].

Hydrochrothiazide is the mostly used diuretic in the management of hypertension but clinical trials reveal that chrorthalidone has the ability to reduce blood pressure more, especially in RH. It is preferable to switch to chorthalidone with starting dose of 12.5 mg per day and it can be increased up to 50 mg per day[13,14]. Indapamide, a thiazide like diuretic, with a starting dose of 1.5 mg is a better option for elderly and patients with renal insufficiency[15].

In certain patients with RH, shifting one antihypentensive drug to night time dosing may help to control BP and recent trials reveal that this will lead to less cardiovascular events especially in RH[16].

Spironolactone is recommended as the fourth drug to be used in RH and should be started with 25 mg per day and should be increased gradually over several months to maximum dose of 100 mg per day[17]. Amiloride is an alternative in the event of intolerance of spironolactone. When using both medications close monitoring of serum potassium levels is needed and if it exceeds 4.5 m mol/ l, increasing the thiazide dose should be considered[18].

Treatment regimens for RH should not combine the ACE inhibitors and angiotensin receptor blockers (ARB) as the trials have not shown any benefit[19].

Majority of patients with RH achieve BP control when drug doses are optimized and can be managed in primary care level. Indications for specialist referral include, suspected secondary hypertension, evidence of target organ damage, eGFR<30ml/min/1.73m^2, eGFR reduction of 15% within 3 months, proteinuria>1g/day, need of >4 antihypertensive drugs[6].

Patients who remain uncontrolled need to be started on other drugs with the direction of the specialist. These drug categories include: Beta-blockers (eg. carvedilol, labetelol), Alpha-blockers (eg. prazocin), Centrally acting sympatholytic (eg. clonidine, methyldopa), Direct vasodilators (eg. hydralazine, minoxidil). There are no adequate studies done on use of these drugs in RH at present and the selection of the drug depends on the condition of the patient and prescribers experience[6].

For those patients who still remain uncontrolled despite optimal therapy there are interventional treatment options like renal denervation and carotid sinus stimulation which shows promising effects but need further research.

Present drug regimen of Chitra includes a thiazide diuretic, ARB and an alpha blocker and plan will be to add on a calcium channel blocker in the event of poor control of BP. Follow up BP in 2 weeks was 130/80 mm Hg. This case scenario shows that in RH, normotension can be achieved by conscientious treatment decisions. It further highlights the importance of step wise approach with traditional drugs followed by additional agents to reach 4 or 5 drug regimen whenever need arises.

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Obstructive sleep apnoea

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Sri Lankan Family Physician, 2017, **33**, 62-65

Mr S C 40 years old male from Gangodawila presented to the Family Practice Centre due to excessive daytime sleepiness for 2 years duration. He had been snoring for the last 10 years but he developed day time sleepiness only during the last 2 years. He was finding it increasingly embarrassing both at the work place and at home as he was falling sleep for about 1-2 minutes while talking to customers at the work place and while talking to his wife at home. He was bullied by his friends at work place as he was fallen asleep on several occasions while talking to his friends. When he fell in to short nap during day time and he snored as well. So he felt it difficult to face friends. He also fell in to spells of short sleep while operating his computer at the work place, just after lunch, while watching TV, while travelling in a car or bus. He faced difficulties in driving his car because he felt very sleepy. There was no constipation. There is recent weight gain.

Past medical history: – He did not have bronchial asthma, diabetes mellitus, and hypertension. He was diagnosed of having high cholesterol 6 months back and also increase in liver enzymes when he had visited a GP as he felt he had a large abdomen.

Past surgical history: – When he was 6 years old surgery on nasal septum had been done but he did not have any details.

Family history: – His mother was suffering from diabetes mellitus, hypertension, and high cholesterol and died at the age of 53 years due to Ischaemic Heart Disease (IHD). His father was hypertensive and is suffering from a Cerebro Vascular Accident (CVA). His elder brother is a known diabetic and hypertensive patient and suffering from end stage renal failure and waiting for renal transplant. His sister is suffering from diabetes and hypertension too. His mother's two brothers died prematurely due to IHD.

Sexual history: – There is no impotence or any related problems.

Social history: – He is a computer operator at a private firm. He is married and his wife is a house wife. He has two children. Both are daughters and aged 8 and 5 years. He does not take alcohol and he does not smoke. He didn't have any recreational activities. He didn't engage in any exercise and was entirely sedentary.

Allergy history – He did not have any food or drug allergy.

Examination

General: – Weight 69 kg, Height 166 cm, BMI 25, Waist circumferance 100 cm, nasal voice, face dark color.

On examination of nose – nasal passage blocked on both sides, Left nasal turbinate enlarged.

On examination of oral cavity – malampathi score grade iii

Cardio vascular system: – pulse 74/min good volume regular

BP 130/90 mmHg , Heart dual rhythm no murmurs

Respiratory system: – Air entry both sides normal and vesicular, no added sounds.

Abdomen: – distended, non-tender. Liver and spleen not palpable.

Investigations

FBC WBC/DC 7100 N 49 L 49 E 2 Hb 14.7 PCV 41.8% Platelet 284000

CRP 7.7 mg/l

Serum Creatinine and eGFR 1.3 mg/dl 61.1 ml/min/1.73m^2

BU 16 mg/dl

FBS 122 mg/dl

HbA1c 6.2%

Lipid profile Total Cholesterol 302 mg/dl, TG 223 mg/, HDL 40 mg/dl, LDL 217.4 mg/dl, VLDL 44.6 mg/dl

Liver profile Total protein 74.6 g/l, albumin 42.9 g/l, globulin 31.7 g/l, A/G ratio 1.3, T. bilirubin 0.49 mg/dl, Alkaline phosphatase 136.1 u/l, ALT 100 u/l, AST 46.5 u/l, Gamma GT 51.3 u/l

TSH 4.6 U/ml

Ultra sound scan of abdomen – except moderate fatty liver other findings are normal.

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Management

Non pharmacological management

Dietary management for overweight, high waist circumference, impaired blood sugar and fatty liver.

Regular physical exercises.

Recreational activities and meditation or yoga for mental relaxation.

Pharmacological management

Monteleukast 10 mg nocte for 6 months

Ketotifen 1 mg nocte for 6 month

Desloratidine 5mg nocte for 1 month

Probeeta nasal drops bd for 1 week

Levothyroxin 50 mcg mane for 1 month

Rosuvastatin 20 mg vesper for 1 month

Third visit 2017/08/10

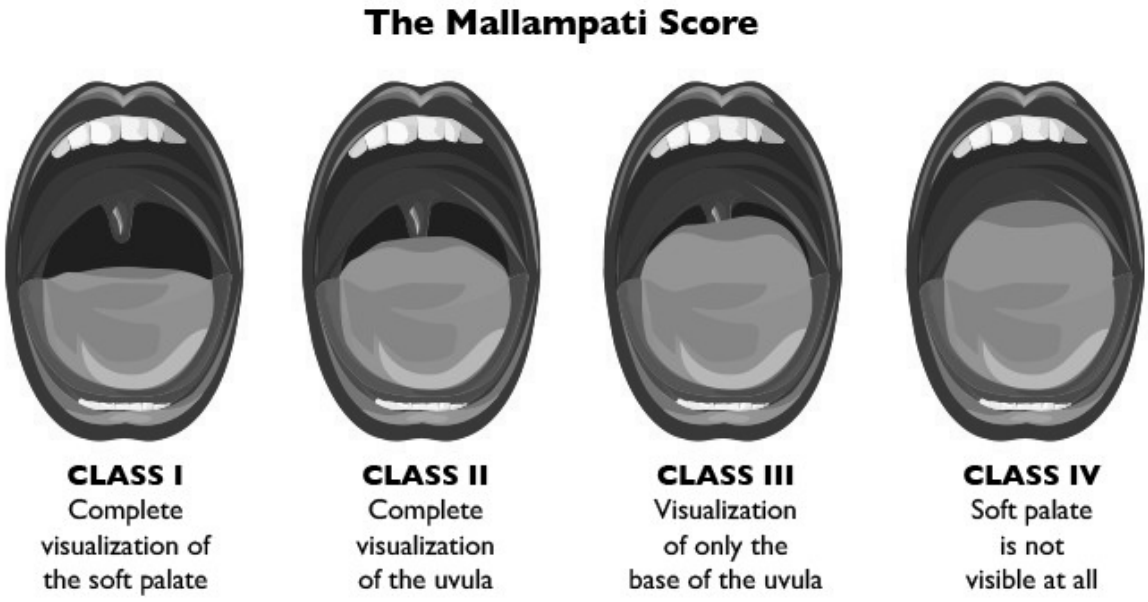
His symptoms have improved. Now he is not falling asleep at the computer or while speaking to customers or watching television. But he feels sleepy and falls asleep while chanting pirith. Presently he sleeps from 10.00 pm to 4.30 am without disturbance and only occasionally gets up to pass urine.

He has started to exercise daily – jogging 6 km per day and has lost weight by 2 kg. His BP is 120/80mmHg.

Fourth Visit 2017/08/28

His symptoms have improved very much as well as his feelings. Now he is not falling asleep at all during the day time. According to his wife now snoring is much less at night. Now he can confidently drive without falling asleep.

Lipid Profile	
Total Cholesterol	147.9 mg/dl
Triglycerides	113.4 mg/dl
HDL	44 mg/dl
LDL	81.2 mg/dl
VLDL	22.6 mg/dl
CHO/HDL	3.3
LDL/HDL	1.84
ALT (SGPT)	48.9 u/l
Serum Creatinine and eGFR	1.21 mg/dl 74 ml/ min/ 1.73 m^2



Modified Malampati Classification

Class 0 – ability to see any part of the epiglottis upon mouth opening and tongue protrusion

Class I – soft palate, fauces, uvula, pillars visible

Class II – soft palate, fauces, uvula visible

Class III – soft palate, base of uvula visible

Class IV –soft palate not visible at all

The assessment is performed with the patient sitting upright, mouth open and tongue maximally protruded, without speaking or saying "ahh".

Reference: J J Lamberg, Malampati clasification, Medscape cited on 2017/09/04 emedicine.medscape.com

Discussion

Epidemiology

OSAS prevalence in Western countries is about 4% in middle aged men and about 2% in middle aged women[1]. As incidence of obesity is increasing incidence of OSAS is increasing.

Prevalence of OSAS is high in type 2 diabetes and related metabolic conditions and glucose intolerance[2].

Risk factors for OSAS[3].

Obesity, Male gender, Middle age, Smoking, Sedative drugs, Excessive alcohol consumption, Family history, Genetic tendency related to jaw morphology

Patient presentations

History of snoring and witnessed apneas with excessive daytime sleepiness.

Following features may be suggestive of OSAS

Excessive daytime sleepiness, Snoring, Impaired concentration, Unrefreshing sleep, Choking episodes during sleep, Restless sleep, Witnessed apneas, Irritability/personality change, Nocturia, Decreased libido.

Assessment of day time sleepiness

By using Epworth Sleepiness Scale and investigation is usually recommended if score is more than 10(1). If Epworth Sleepiness Scale score is >18 or patient has had a road traffic accident or near miss event an urgent referral is recommended[4].

On examination following may be significant. Obesity, Anterolateral fat deposition in the upper airway, Neck circumference (> 37cm low risk, >48 cm high risk), cranio-facial and pharyngeal abnormalities such as retrognathia, micrognathia, enlarged tonsils, macroglosia, thickening or lengthening of soft palate or uvula, nasal polyps, rhinitis, any nasal deformity.

Differential diagnosis for OSAS

- Fragmented sleep (quality of sleep), Sleep deprivation (quantity of sleep), Shift work, Depression, Narcolepsy, Hypothyroidism, Restless leg syndrome. Drugs such as sedatives, caffeine, amphetamines, theophyllines, beta blockers, SSRIs, excess alcohol, Neurological conditions such as Dystrophicamyotonica, previous encephalitis, previous head injury, Parkinsonism

Diagnosis is defined if five or more respiratory events such as apneas, hypopneas, or arousals per hour in association with symptoms of sleep disturb breathing. Clinical assessment alone not sufficient to make a diagnosis and use of nocturnal monitoring of respiratory, sleep and cardiac parameters[5].

Polysomnography (PSG)

It is the traditional gold standard investigation. Electro encephalogram (EEG), Electro occulograms (EOG), Electromyogram are used. Number of apnoea/ hypoapnoea episodes whilst asleep is quoted as the apnoea / hypoapnoea index (AHI).

- Mild: AHI = 5-14 per hour.
- Moderate: AHI = 15-30 per hour.
- Severe: AHI >30 per hour.

Blood pressure

Thyroid function test

Associated diseases

Hypertension, Cardiovascular disease[10], Obesity, Metabolic syndrome, Diabetes, Asthma[6].

Management

Behavioral interventions – Life style changes such as weight loss, smoking cessation, avoidance of alcohol in the evening as should sedative and hypnotic medication.

CPAP – gold standard treatment and nasal CPAP is highly effective in controlling symptoms, improving quality of life and reducing the clinical sequelae of sleep apnoea[6].

Pharmacological treatment

Modafinil may have some benefit in patients with daytime sleepiness who are compliant with CPAP[8].

Surgery

Usually considered for patients for whom CPAP or oral appliances have failed or contraindicated.

Uvulo palatopharyngioplasty, laser assisted uvulo-paltopharyngioplasty, radiofrequency ablation of the tongue base, suspension of hyoid bone, maxillofacial surgery, tonsillectomy, tracheostomy,

Other treatments

Positional therapy is beneficial for those with postural OSAS and prevent them from sleeping in the supine posture – "tennis ball technique" – consisting of a tennis ball strapped to the back to discourage supine position.

Oral appliances – useful alternative to CPAP for the treatment of patients with mild to moderate OSAS and for those patients with severe disease intolerant to CPAP. Most commonly used oral appliances are mandibular advancement splints. Transient side effects are excessive salivation, dry mouth and gingival irritation. Persistent side effects are arthralgia, teeth pain, occlusal changes[9].

Complications

Accidents in the home, at work place and during driving due to excessive daytime sleepiness.

Increased risk of cardiovascular morbidity and road traffic accidents.

Irritability, depression, and other psychological consequences.

Cardiovascular complications such as hypertension, coronary artery disease and congestive cardiac failure.

An independent risk factor for stroke[10,11].

Increased risk of hypertension[12], heart failure[13] and type 2 diabetes mellitus[14].

Prognosis

Can lead to neurocognitive and cardiovascular morbidity. Cognitive impairment can lead to reduced concentration, accidents, and memory problems.

Treatment of OSAS significantly reduces the cardiovascular complications.

CPAP treatment can significantly reduce blood pressure in patient with comorbid hypertension.

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Osteoporosis

W A H Sujeewa[1]

Sri Lankan Family Physician, 2017, **33**, 66-69

Mrs. Ramani Silva is a 62 year old lady from Moratuwa. She complained of backache and left arm pain for the last 1 year. She had consulted several doctors.

Past medical history: – She did not have diabetes mellitus, hypertension, or dyslipidemia. There had been a history of fracture of the elbow at the age of 12 years and fracture of left ankle joint at the age of 15 years.

Past surgical history: – She had met with an accident 10 years back and there was a history of trauma to the left knee joint. Left knee replacement was done in March 2016.

A multinodular goitre was removed by right hemi thyroidectomy in March 2010.

Family history: – There was no history of osteoporosis in her family. Her mother died at the age of 82 years due to Ischaemic Heart Disease and her father died at the age of 92 years. She has two brothers and both are well.

Menstrual History: – Iatrogenic menopause had occurred after total abdominal hysterectomy and bilateral salphingo oophorectomy (TAH and BSO) at the age of 42 years. She had taken HRT for 4 years and stopped by herself due to fear of side effects. After that no clinic follow up was done.

Social History: – She is a house wife. She is a nonsmoker and teetotaler. Her husband is a businessman. She has a son and a daughter. Both of them are married and live abroad.

Examination

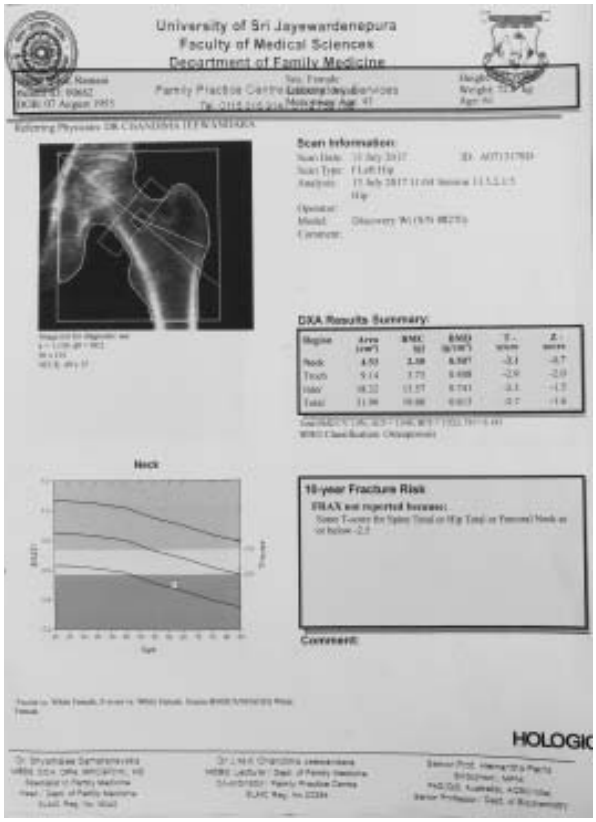
General: – Weight 72 kg, Height 155 cm, BMI 30, not pale, afebrile.

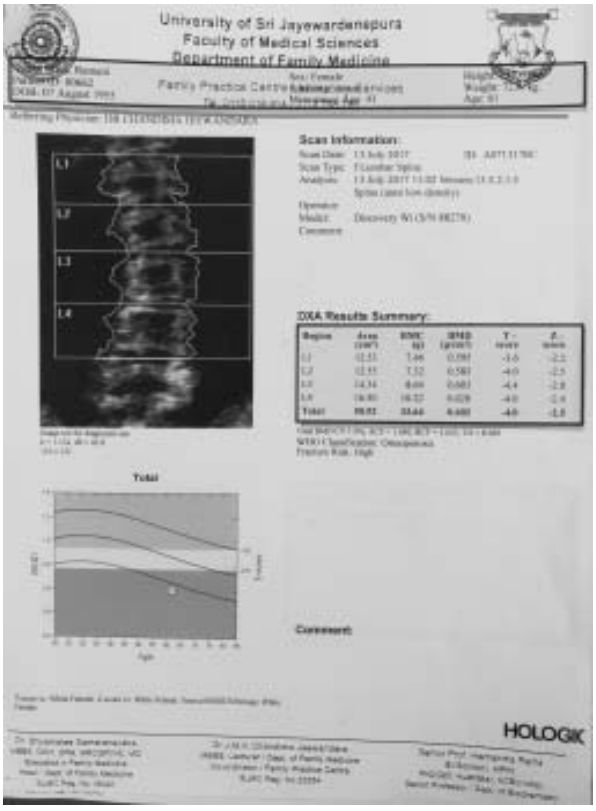
CVS: – Pulse 82/min good volume regular, BP 130/90 mmHg, Heart dual rhythm no murmurs.

RS: – Air entry to both lungs good and equal, breath sounds vesicular and no added sounds.

ABD: – abdomen soft, non tender, liver spleen not palpable.

Investigations





[1] *Senior Registrar in Family Medicine, PGIM, Colombo, Sri Lanka.*

Management

Pharmacological management

Calcium lactate (Kalzana) 1 tab daily

1 alfacholecalciferol 0.5 mg daily (alfacalcidol)

Alendronate 70mg weekly first thing in the morning and sit upright at least for ½ hour.

Non pharmacological management

Advice regarding adequate nutrition – fresh milk, curd, yoghurt, small fish.

Regular exercise such as jogging or walking.

Discussion

Osteoporosis is defined as bone marrow density of more than 2.5 SD below the young adult mean (T score of – 2.5[1,2].

Osteopenia is diagnosed as if T score is between – 1 and – 2.5[1,2].

Z score; compare the BMDs of subjects and aged matched normal controls. It cannot be used to diagnose osteoporosis and osteopenia. It is useful in young patients to predict osteoporosis risk of fracture.

Causes of Osteoporosis[3]

Primary

- Increasing age (risk increased partly independent of reducing BMD).
- Female sex.
- Low body mass and anorexia nervosa. (Low body mass is defined as <19 kg/m^2 by NOGG and as <18.5 kg/m^2 by NICE.)
- Parental history of hip fracture.
- Past history of fragility fracture (especially hip, wrist and spine fracture).
- Corticosteroid therapy (current treatment at any dose orally for three months or more).
- Cushing's syndrome.
- Alcohol intake of three or more units per day.
- Smoking.
- Falls and conditions increasing the risk of falls such as:
    - Visual impairment.
    - Lack of neuromuscular co-ordination or strength.
    - Cognitive impairment.
    - Sedative medication and alcohol.

Secondary

Endocrine: – Hypogonadism (premature menopause, anorexia, androgen blockade, anorexia, use of aromatase inhibitors), Hypothyroidism, Hyperparathyroidism, Hyperprolactinemia, Cushing's disease, Type I DM.

GI: – Coeliac disease, Other causes of malabsorption, Inflammatory Bowel Disesae, Chronic liver disease, Chronic pancreatitis.

Rheumatological: – Rheumatoid Arthritis, Other inflammatory arthropathies.

Drugs

Aromatase inhibitors, Androgen deprivation therapy, Proton pump inhibitors, Enzyme inducing anticonvulsants, Long term depot medroxy progesterone acetate, Long term anti depression, Thiazolidinodiones.

Other: – Immobility, Multiple Myeloma, Haemaglobinopathies, Systemic mastocytosis, Cystic Fibrosis, Chronic Kidney Disease, COPD, Homocystenuria.

Fragility fracture

Fracture sustained falling from less than standing height including vertebral collapse.

Common fractures

*Hip fracture – associated with increase mortality.

*Wrist – Colles fracture

*Osteoporotic vertebral collapse – present with pain, reduced height and kyphosis. If other analgesics are ineffective calcitonin is useful for pain relief for 3 months after vertebral collapse.

Following patients should be assess for fracture risk according to the NICE guidelines[1]

- All women aged 65 years and over.
- All men aged 75 years and over.
- Women aged under 65 years and men aged under 75 years in the presence of risk factors, essentially those listed above. For example:
    - Previous fragility fracture.
    - Current use or frequent recent use of oral or systemic glucocorticoids.
    - History of falls.
    - Family history of hip fracture.
    - Causes of secondary osteoporosis.
    - Low body mass index (>18.5 kg/m^2).
    - Smoking.
    - Alcohol intake of more than 14 units per week for women and more than 21 units per week for men.

Bone Mineral Density (BMD) Measurement

X rays cannot be used to measure BMD but are useful if vertebral fracture or metastases are suspected

DEXA Scan (Dual Energy X ray Absorptiometry) – hip and lumber spine BMD is measured.

Do not request DEXA without prior use of risk prediction tool.

Fracture prediction can be used to assess 10 year fracture risk by using FRAX tool or QFracture tool

FRAX and **QFracture** are two validated fracture prediction tools and both provide information on 10 year probability of hip or other osteoporotic fracture.

FRAX – can be performed with or without BMD measurement.

FRAX questionnaire

Age (40-90y) Sex Weight (kg) Height (cm) Previous fracture Parent fracture hip, Current smoking, Glucocorticoids, Rheumatoid arthritis, Secondary osteoporosis, Alcohol 3 or more units per day, Femoral neck BMD

Qfracture – does not require BMD measurement.

Treatment options for osteoporosis[4]

***Life style advice**

Adequate nutrition – maintain body weight so BMI >19 kg/m^2, adequate intake of calcium and vitamin D supplements to post menopausal women with dietary deficiency. On long term steroids, >80yrs, housebound, institutionalized.

Regular exercise – weight bearing activity > 30 min per day

Stop smoking

Stop or reduce alcohol intake

***Bisphosphonates** – Alendronic acid 70 mg once weekly, decrease bone loss and fracture, mainstay of treatment of osteoporosis.

Avoid in severe CKD and child bearing age.

Take on an empty stomach first thing in the morning – 30 min before food or other medication. Take the medicine in an upright position washed down with plenty of water and sit upright for 30 minutes after taking the drug.

Rare complication is osteonecrosis of the jaw (IV> PO). Can cause non healing gum ulcers.

Causes atypical femoral fractures if prolonged bisphosphonate treatment > 5 yrs. To prevent this a drug holiday of 1-5 years after 5 year use.

***Raloxifene (SERM** – selective estrogen receptor modulator) 60 mg once a day

Patients with previous fragility fracture if bisphosphonates are contraindicated not tolerated or unsatisfactory response. Not recommended for primary prevention.

Avoid if past history of DVT/PE, cholestasis, endometrial cancer or undiagnosed vaginal bleeding.

***Denosumab** – 60 mg SC every 6 months. It's a monoclonal antibody that decrease osteoclastic activity and bone resorption. Can be used for women with severe CKD.

May cause osteonecrosis of the jaw.

***HRT**

Postpones post menopausal bone loss and decrease fractures. Optimum duration of use is uncertain but usually for 5 to 7 years. Benefit disappears < 5 years after stopping. Increase in breast cancer incidence and CVS risk limits its use.

Indications

Premature menopause – HRT is recommended for the prevention of osteoporosis until women reach 51 years.

Over the age of 51 years, HRT should not be considered as first line therapy for long term prevention of osteoporosis. But it remains an option where other therapies are contraindicated.

***Teriparatide**

Second line treatment for men with past history of fragility fracture; third line treatment for post menopausal women.

It's given by daily injection. Maximum duration of use is 18 months.

***Indications for referral**[4]

1. Another cause of fragility fracture is suspected such as metastasis
2. Fragility fracture occurs on treatment
3. Unusual presentation of osteoporosis such as premenopausal women

Acknowledgment

I would like to thank Prof. M S A Perera for editing this article.

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The English Language

Have you wondered why foreigners have trouble with the English Language?

Let's face it
English is the stupid Language.
There is no egg in the eggplant
No ham in the hamburger
And neither pine nor apple in the pineapple.
English muffins were not invented in England
French fries were hot invented in France.

We sometimes take English for granted
But it we examine its paradoxes we find that
Quicksand takes you down slowly
Boxing rings are square
And a guinea pig is neither from Guinea nor is it a pig.

It writers write, how come fingers don't fing.
It the plural of tooth is teeth
Shouldn't the plural of the phone booth be phone beeth
If the teacher taught,
Why didn't the preacher praught.

If a vegetarian eats vegetables
What the heck does a humanitarian eat!?
Why do people recite at a play
Yet play at a recital?
Park on driveways and
Drive on parkways

You have to marvel at the unique lunacy
Of a language where a house can burn up as
It burns down
And in which you fill in a firm
By filling it out
And a bell is only heart once it goes!

English was invented by people, not computers
And it reflects the creativity of the human race
(Which of course isn't race at all?)

That is why
When the stars are out they are visible
But when the lights are out they invisible
And why it is that when I wind up my watch
It starts
But when I wind up this observation,
It ends.

Natures miracles

S Kumaran[1], **A Perera**[2]

Sri Lankan Family Physician, 2017, **33**, 70

In the heart of Jaffna, about 10 km from Point Pedro there is a sleepy village called Manalkadu. In this village, there is a forest of pine trees. We believe that these trees belong to Phylum Coniferophyta, class Pinopsidae and Genus Pinus and their origin is in North America. Also called eastern white pine tree, the branches of the tree is used during Christmas time for decoration in Jaffna Christian homes. The leaves sprout in the form of clusters of needles. The flowers develop into fruits in the form of cones. We believe that it is also called Ponderosa pine. The tree grows very tall, sometimes up to 180 feet and some of these trees live for more than 500 years[1]. Across this forest of beautiful trees runs a road through which one may walk and enjoy the peace and quiet of the forest. One side of the forest is bordered by the sea which is deep and rough unlike the shallow sea in Point Pedro and washes out the sand into the beach forming a tall sandy dune. This sandy dune slopes down into the forest.

Throughout the year, the leaves fall from the trees and settle under them. The dried fallen leaves form a mattress under the trees covering the ground which is 1-2 feet deep. Walking through the forest, one sees the ground a covered in a brown blanket of dried and decaying leaves. Also, if you look up at the trees various shapes are seen due to the natural branching of the tree as well as irregular shedding of leaves. Sometimes these resemble shapes of human figures or animals giving a beautiful and creative appearance pleasing to the eye.

During certain times of the year, just after rain fall, birds fly into the forest and build nests on the trees in which they lay their eggs. The nests are built at the top of the tree so that various animals such as cats that live in the forest are unable to climb so far and reach them and thus eat the eggs or devour the young birds. During the rainy season, the sea overflows over the sand dunes in a flood carrying the small fish that live in the sea. The sea water flows across the road onto the other side forming small ponds. These ponds which contain salt water become dry during the hot season to fill up again when the sea overflows. The flood carries with it, the debris on the ground consisting of dried leaves and remains of young birds that could not fly. This ensures a source of food for the small fish that have got washed into and live in the small ponds or lagoons. The nesting corresponds to the end of rainy season and once the birds hatch out, the adult birds go fishing in these small lagoons for little fish. These latter are carried in their beaks to feed their young, now resident in the nests on top of the trees. When the young ones are ready to fly they leave the nest and fly off together with the adults. Some who have not mastered the art of flying fall onto the ground which is rich with dried leaves and they become the food for the animals that roam round and also serve as food for the fish that gets carried into the lagoons.

Every year, this cycle is repeated with the nature supporting the survival of the birds that come there for breeding. They are able to breed here and take their progeny back to where they came from.

In this area the Painted Stork, Black headed Ibis, great, intermediate and little Egrets, Cormorants, Gulls and Turns have been spotted. Whether some of them are migrants or not we do not know. Jaffna peninsula is a mecca for the migrant birds. Why birds migrate is not yet fully understood by man. The simple explanation is probably food, safe breeding grounds and the weather. In the story we have presented, it shows how the nature supports the breeding of these birds. The migrant birds arrive in Sri Lanka from August /September to April /May. Being able to fly possibly helps them to avoid the harsh winter conditions in their countries of origin. Often it has been observed that some bird populations have been spotted making their way to the same places they visited before. The specific routes they take are thought to be genetically programmed or learned to varying degrees. Even though some birds return along different routes, often, the birds are known to take the same route they arrived in[2].

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Acknowledgements

We thank Dr Sankha Randenikumara former student President of the Nature and Photography Club of the Faculty of Medical Sciences, University of Sri Jayewardenepura for his expert advice on preparation of this document.

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